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## **TRANSPORTATION IMPACT ASSESSMENT**

**1310 ADELAIDE STREET NORTH AND 795  
WINDERMERE ROAD**

**LONDON, ONTARIO**

**PROPOSED COMMERCIAL DEVELOPMENT**

**2796539 ONTARIO INC.**

**JULY 2023 (UPDATED NOVEMBER 2023)**

**SBM-21-0642**

### **LONDON LOCATION**

1599 Adelaide Street N. Units 301 & 203  
London, Ont, N5X 4E8  
P: 519.471.6667

### **KITCHENER LOCATION**

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Kitchener, Ont, N2R 0L3  
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2796539 Ontario Inc.  
#425 509 Commissioners Road West  
London, Ontario N6K 1J5

November 10, 2023  
SBM-21-0642

**Attn: Farhad Noory**

**Re: Transportation Impact Assessment  
1310 Adelaide Street North and 795 Windermere Road  
London, Ontario**

Strik, Baldinelli, Moniz Ltd. is pleased to provide you with the enclosed Transportation Impact Assessment report for the proposed commercial development at 1310 Adelaide Street North and 795 Windermere Road in London, Ontario.

We trust this submission meets your satisfaction and will assist with the approval of your development. Should you have any questions or require additional information, please do not hesitate to contact the undersigned.

Respectfully submitted,

**Strik, Baldinelli, Moniz Ltd.**

Planning • Civil • Structural • Mechanical • Electrical

Jonah Lester, P.Eng.  
Transportation Engineer

## **EXECUTIVE SUMMARY**

This Transportation Impact Assessment (TIA) has been prepared by Strik, Baldinelli, Moniz Ltd. (SBM) for 2796539 Ontario Inc. to identify transportation impacts, or a lack thereof, associated with the proposed commercial development located at 1310 Adelaide Street North and 795 Windermere Road in London, Ontario. The development is proposed to include two commercial buildings; one for retail (458 m<sup>2</sup>) and one for a fast-food restaurant with a drive-through window (517 m<sup>2</sup>). Vehicular access is proposed from Adelaide Street North and Windermere Road.

This study has forecasted traffic volumes for a 2029 horizon year and assessed traffic operations within the vicinity of the subject site for existing, future background and future total traffic conditions. Site access and active transportation considerations have also been assessed. Based on the analysis completed, the following key conclusions and recommendations are made in this TIA:

- It is forecast that the proposed development will generate 103 new trips in the PM peak hour (56 in and 47 out) and 157 new trips during the Saturday peak hour (82 in and 75 out).
- Under existing conditions, the Adelaide Street North and Windermere Road intersection is operating at a higher v/c ratio (overall 0.91) during the PM peak hour with the eastbound left turn movement at LOS E with queuing that extends beyond the left turn lane and occasionally blocks access to the through and right turn lane, therefore the City may wish to monitor the intersection operations to assess whether extension of the eastbound left turn lane is warranted. The Saturday peak hour operates well.
- Under 2029 background traffic conditions, the eastbound left turn, northbound left turn, and southbound through movements at the Adelaide Street North and Windermere Road intersection reach capacity (v/c ratios between 0.99 and 1.01) during the PM peak hour, and the eastbound and northbound turn lane queues will extend beyond their available storage lengths and occasionally block through traffic.
- Under 2029 total traffic conditions, the critical movements at the Adelaide Street North and Windermere Road intersection remain identical to the background traffic operations, and all other movements operate acceptably, which indicates that the site traffic from the proposed development will have no significant impact on the intersection operations. The only potential impact is to the queue length for the southbound left turn movement since the results show that the future queue may extend up to 10 m beyond the available storage lane length, however, this would be for only a brief time and can likely be accommodated within the left turn lane taper so no significant blockage of the southbound through lane is expected.
- Both site accesses are expected to operate well and there are no concerns about the access locations.
- The need for a right turn lane on Adelaide Street North at the West Site Access was considered with respect to the City of London Access Management Guidelines and it was concluded that the turning volumes are not high enough to warrant a right turn lane.
- The proposed multi-use path along the north edge of the site and the proposed sidewalk connections at both site accesses will provide good pedestrian access to the site.
- Other than the extension of the divisional island on Adelaide Street North to physically restrict left turn movements at the West Site Access, no improvements to the external road network are required to accommodate the proposed development.

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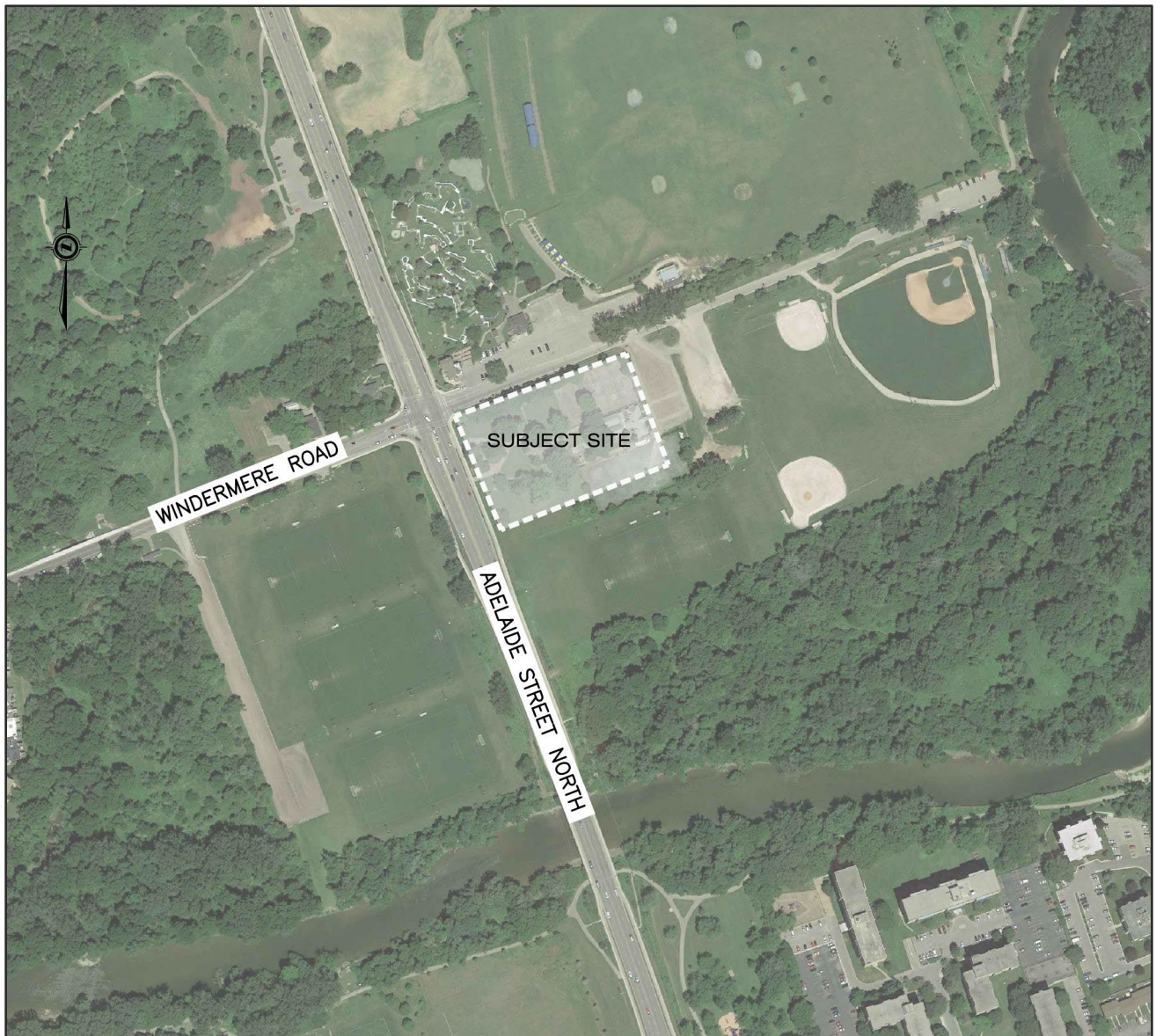
**APPENDIX E – SYNCHRO OUTPUT REPORTS - 2029 TOTAL TRAFFIC**



## 1 INTRODUCTION

This Transportation Impact Assessment (TIA) has been prepared by Strik, Baldinelli, Moniz Ltd. (SBM) for 2796539 Ontario Inc. to identify transportation impacts, or a lack thereof, associated with the proposed commercial development located at 1310 Adelaide Street North and 795 Windermere Road in London, Ontario. The development is proposed to include two commercial buildings; one for retail (458 m<sup>2</sup>) and one for a fast-food restaurant with a drive-through window (517 m<sup>2</sup>). Vehicular access is proposed from Adelaide Street North and Windermere Road. The location of the proposed development is illustrated in Figure 1.

**Figure 1: Site Location**



Aerial Image Source: Google Earth (July 2018 imagery)

## 1.1 SCOPE AND METHODOLOGY

The general scope of the analysis in this study is summarized in Table 1. In accordance with the City of London Transportation Impact Assessment Guidelines (2013), the TIA scope was confirmed with City staff prior to commencing the assessment.

**Table 1: Study Scope and Parameters**

Study Scope and Parameters	
Analysis Intersections (Study Area)	<ul style="list-style-type: none"> <li>• Adelaide Street North / Windermere Road</li> <li>• Adelaide Street North / Proposed Site Access</li> <li>• Windermere Road / Proposed Site Access</li> </ul>
Analysis Time Periods	<ul style="list-style-type: none"> <li>• Weekday PM peak hour</li> <li>• Saturday mid-day peak hour</li> </ul>
Analysis Scenarios (Years)	<ul style="list-style-type: none"> <li>• Existing Traffic</li> <li>• 2029 Background Traffic</li> <li>• 2029 Total Traffic</li> </ul>

The intersection operational analysis has been performed using Synchro 11 software based on the Highway Capacity Manual 2000 (HCM 2000) methodology published by the Transportation Research Board National Research Council.

As per the City's TIA Guidelines, the operational analysis has identified all intersections where:

- the volume to capacity ratio (v/c ratio) for overall operations, through movements, shared through/turning movements increased to 0.9 or above and Level of Service (LOS) E or worse.
- v/c ratios for dedicated turning movements increased to 0.9 or above and LOS E or worse.
- Queues for an individual movement and turning movement projected to exceed available lane storage (95<sup>th</sup> percentile queue).

Level of Service (LOS) is a function of the average control delay for an entire intersection or an individual movement. The relationships between the LOS letters and average delay ranges are defined in Table 2 for signalized and unsignalized intersections.

**Table 2: Vehicular Level of Service Designations**

LEVEL OF SERVICE (LOS)	CONTROL DELAY PER VEHICLE (s)	
	SIGNALIZED INTERSECTION	UNSIGNALIZED INTERSECTION
<b>A</b>	≤ 10	≤ 10
<b>B</b>	10 to 20	10 to 15
<b>C</b>	20 to 35	15 to 25
<b>D</b>	35 to 55	25 to 35
<b>E</b>	55 to 80	35 to 50
<b>F</b>	> 80	> 50

## **2 EXISTING CONDITIONS**

### **2.1 SITE CONTEXT**

The subject site currently consists of two vacant properties, 1310 Adelaide Street North and 795 Windermere Road. The two properties combined have an approximate area of 1.27 hectares with approximately 91 m of frontage along Adelaide Street North. The subject site is bounded by Windermere Road to the north (commercial land use on the opposite side), Adelaide Street North to west (with City recreational fields on the opposite side), and City recreational fields to the east and south, as shown in Figure 2.



**Figure 2: Site Area**



Map Source: Google Earth (July 2018 imagery)

## 2.2 EXISTING ROAD NETWORK

A site visit was conducted on July 12<sup>th</sup>, 2023 to review current road and intersection conditions. The existing road network is described below and the existing lane configurations, traffic control and storage lengths are illustrated in Figure 3.

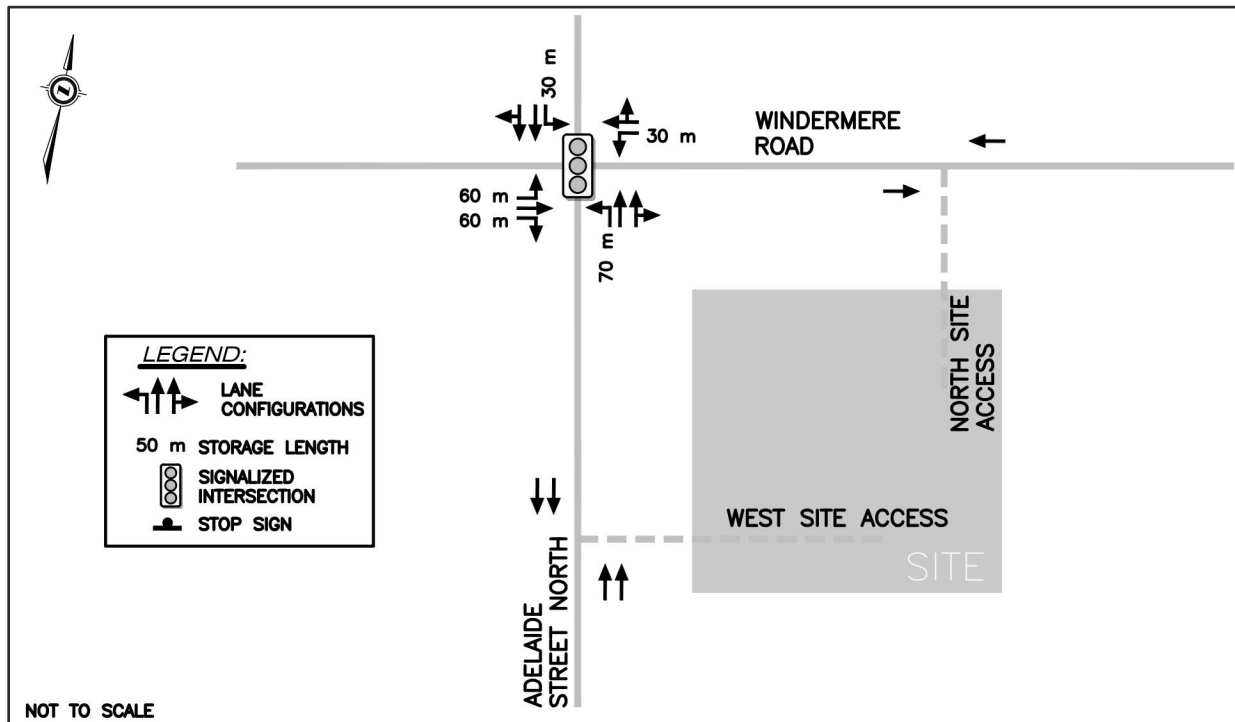
Adelaide Street North is a four-lane arterial road (Civic Boulevard) running north-south with a posted speed limit of 60 km/h. It has an urban cross-section (curb and gutter), with a sidewalk and in-boulevard bike path on both sides, and on-street parking is prohibited.

Windermere Road is a two-lane road running east-west with a posted speed limit of 50 km/h. To the west of Adelaide Street North, Windermere Road is classified as an arterial road (Civic Boulevard) and has a partially-urbanized cross-section with curb/gutter and sidewalk on the north side and a partially paved

shoulder with only a short stretch of sidewalk on the south side near Adelaide Street North. No on-street parking is permitted along this section of Windermere Road.

To the east of Adelaide Street North, Windermere Road is a local road (Neighbourhood Street) without curb and gutter or sidewalk. There is a parking lot on the north side of Windermere Road that has row of parking stalls approximately 80 m long with direct access to the spaces from Windermere Road. There are no on-street parking restrictions along this section of Windermere Road and vehicles are often observed to be parked on the south shoulder.

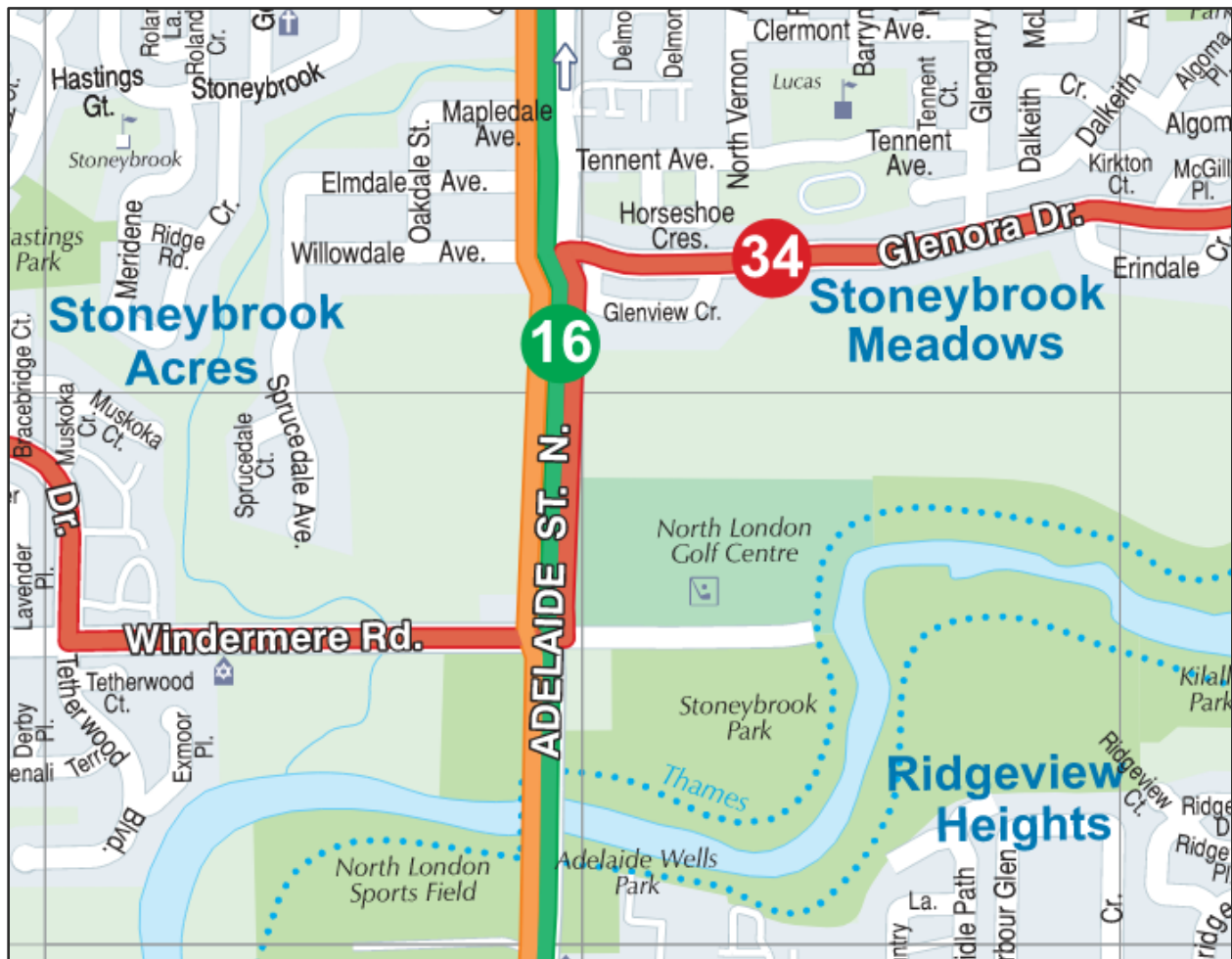
**Figure 3: Existing Study Area Traffic Control and Lane Configuration**



### 2.3 EXISTING TRANSIT SERVICES

The study area is served by bus routes 16 and 34 as shown in the excerpt from the London Transit Commission (LTC) Ride Guide (service map) in Figure 4.

Figure 4: Transit Service Map



Source: London Transit Commission Ride Guide (September 2019)

The general routes, operating times and headways are summarized as follows:

- **Route 16 Masonville Place – Adelaide at Thompson** runs between Masonville Place and Commissioners Road East at Pond Mills Road, primarily via Fanshawe Park Road, Adelaide Street, and Commissioner Road East. Service runs Monday to Saturday approximately 6:00 AM to 1:00 AM and Sundays 7:00 AM to 11:00 PM with approximately 14-30 minute headways.
- **Route 34 Masonville Place – Sunningdale at Village Walk** loops around the north end of the city connecting Masonville Place to Western University and running primarily along Windermere Road, Adelaide Street North, Glenora Drive, Grenfell Drive, and Fanshawe Park Road East. Service runs Monday to Friday approximately 6:00 AM to 12:00 PM, Saturdays 8:00 AM to 11:00 PM, and Sundays 10:00 AM to 9:00 PM with approximately 40 minute headways.

The nearest bus stops to the site are located on Adelaide Street North, just north of Windermere Road, which are approximately 45 m north of the site and should provide good transit access for the proposed development.



## 2.4 ACTIVE TRANSPORTATION FACILITIES

In the study area, sidewalks exist along both sides of Adelaide Street North. On Windermere Road, there is an existing sidewalk on the north side of the road to the west of Adelaide Street north.

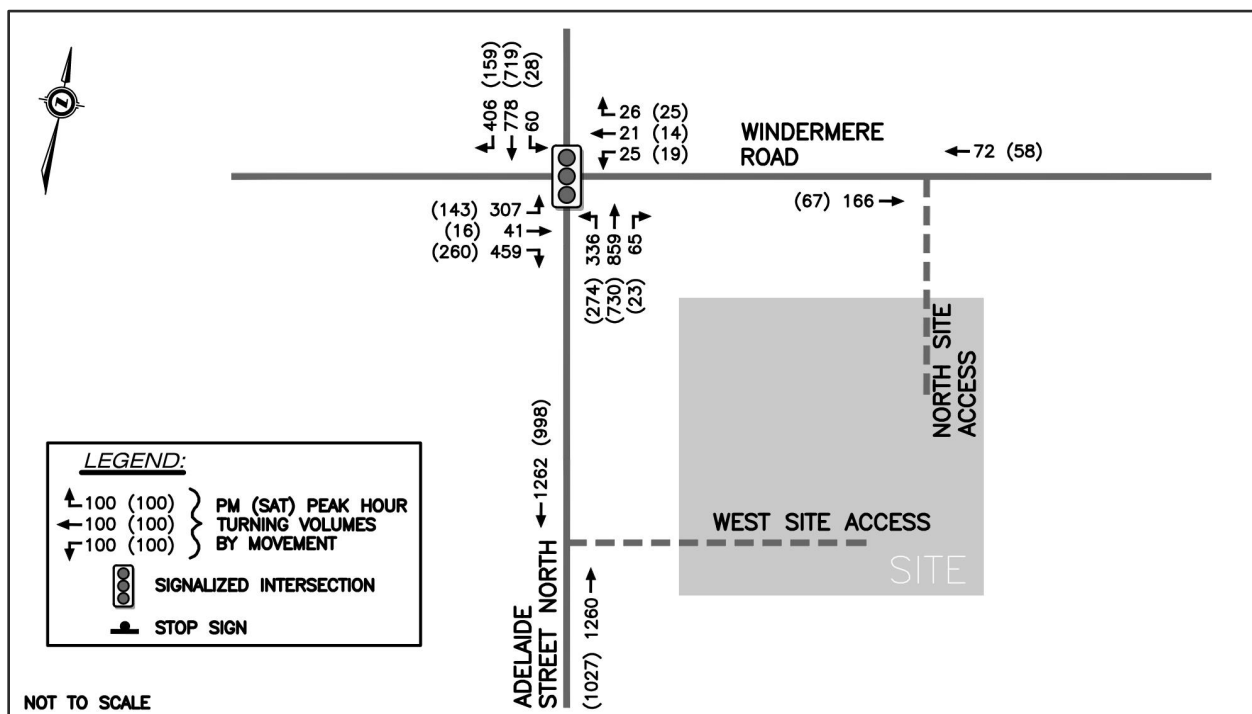
Designated cycling facilities through the study area consist of in-boulevard paved bicycle paths on each side of Adelaide Street North.

## 2.5 EXISTING TRAFFIC VOLUMES

The City’s most recent turning movement count for the Adelaide Street North and Windermere Road intersection was from November 2022, which although quite recent, would not have included traffic from the various recreational uses along the east end of Windermere Road that are only operational during the warmer months of the year. Additionally, the City’s count did not include any Saturday traffic data, therefore new traffic counts were completed.

New turning movement counts were undertaken by Accu-Traffic Inc. at the Adelaide Street North and Windermere Road intersection on July 5<sup>th</sup>, 2023 during the PM peak period and on July 8<sup>th</sup>, 2023 during the Saturday mid-day peak period. The weekday PM peak hour and Saturday peak hour volumes are illustrated in Figure 5 and the traffic count data is provided in Appendix A.

**Figure 5: 2023 Peak Hour Traffic Volumes**



## 2.6 EXISTING TRAFFIC OPERATIONS AND QUEUING

Existing traffic operations were assessed at the Adelaide Street North and Windermere Road intersection based on the existing lane configuration and traffic volumes presented in Sections 2.2 and 2.5. The existing traffic signal timing plan was provided by the City and used in the analysis.

Table 3 provides a summary of the existing intersection operations and complete Synchro output reports are provided in Appendix B.

**Table 3: 2023 Intersection Operations Summary**

INTERSECTIONS / MOVEMENTS		2023 TRAFFIC			
		PM PEAK HOUR		SATURDAY PEAK HOUR	
		V/C	LOS	V/C	LOS
Overall		<b>0.91</b>	<b>C</b>	<b>0.63</b>	<b>B</b>
Adelaide Street North and Windermere Road	EB L	<b>0.92</b>	E	0.69	D
	EB T	0.09	C	0.06	D
	EB R	0.65	C	0.47	C
	WB L	0.07	C	0.09	D
	WB TR	0.06	C	0.07	D
	NB L	0.88	D	0.60	A
	NB TR	0.43	B	0.30	A
	SB L	0.27	C	0.07	B
	SB TR	0.85	D	0.44	B
<b>Notes:</b> V/C - Volume to Capacity Ratio, LOS – Level of Service EB – Eastbound, WB – Westbound, NB – Northbound, SB - Southbound L – Left, T – Through, R – Right					

From the results shown, it can be seen that the Adelaide Street North and Windermere Road intersection is currently operating at a higher v/c ratio during the PM peak hour with the eastbound left turn movement at LOS E.

Queuing results were also reviewed by comparing the 95<sup>th</sup> percentile queue length from the Synchro analysis with the available storage length for the turn lanes within the study area in order to determine where queues may block adjacent lanes. The results are summarized in Table 4.

**Table 4: 2023 Intersection Queuing**

INTERSECTIONS / MOVEMENTS		AVAILABLE STORAGE (m)	95 <sup>th</sup> PERCENTILE QUEUE (m)	
			2023 TRAFFIC	
			PM	SAT
Adelaide Street North and Windermere Road	EB L	60	<b>115</b>	48
	EB T	-	16	9
	EB R	60	<b>82</b>	42
	WB L	30	11	10
	WB TR	-	13	11
	NB L	70	<b>88</b>	32
	NB TR	-	66	44
	SB L	30	22	9
	SB TR	-	182	91
<b>Notes:</b> EB – Eastbound, WB – Westbound, NB – Northbound, SB - Southbound L – Left, T – Through, R – Right				

The queuing results show that there are a couple existing queuing issues. The 95<sup>th</sup> percentile queue for the eastbound left turn lane (115 m) is much longer than the available 60 m of storage, which will occasionally block the through lane and access to the right turn lane (which also has a long queue), causing the combined queue to extend even farther to the west. While this condition only occurs for a brief time during the PM peak hour, the City may wish to monitor the operations to assess whether extension of the eastbound left turn lane is warranted.

The northbound left turn lane shows a queue length of 88 m, which is longer than the designated storage area, but can be accommodated within the parallel lane length of the left turn lane and not block any through traffic.

### 3 FUTURE BACKGROUND TRAFFIC

Future background traffic includes existing traffic with a general growth rate applied, plus traffic anticipated to be generated from other developments surrounding the study area. For the purposes of this assessment, it is assumed that the proposed development will be constructed in 2024, therefore a 2029 horizon year was selected for future traffic projections and analysis.

#### 3.1 BACKGROUND GROWTH RATE

As recommended by the City, a background growth rate of 2% per annum was applied to the traffic volumes in the study area.

#### 3.2 BACKGROUND DEVELOPMENT TRAFFIC

No background developments were identified that would affect the study area.

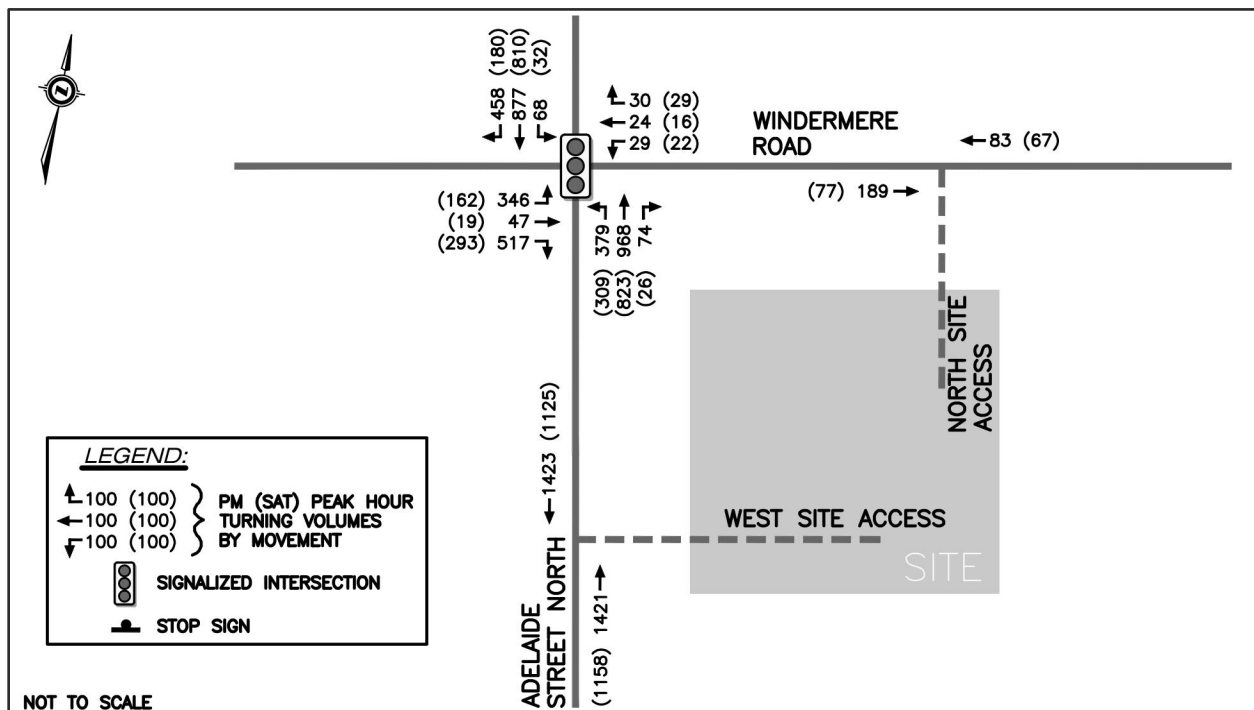
#### 3.3 FUTURE ROAD NETWORK

No future road improvements are planned within the study area that would alter the lane configuration, therefore the existing lane configuration has been used for analysis of future conditions.

#### 3.4 2029 BACKGROUND TRAFFIC VOLUMES

With the background growth rate applied to the existing traffic, the resulting 2029 background traffic volumes are presented in Figure 6.

Figure 6: 2029 Background Traffic Volumes





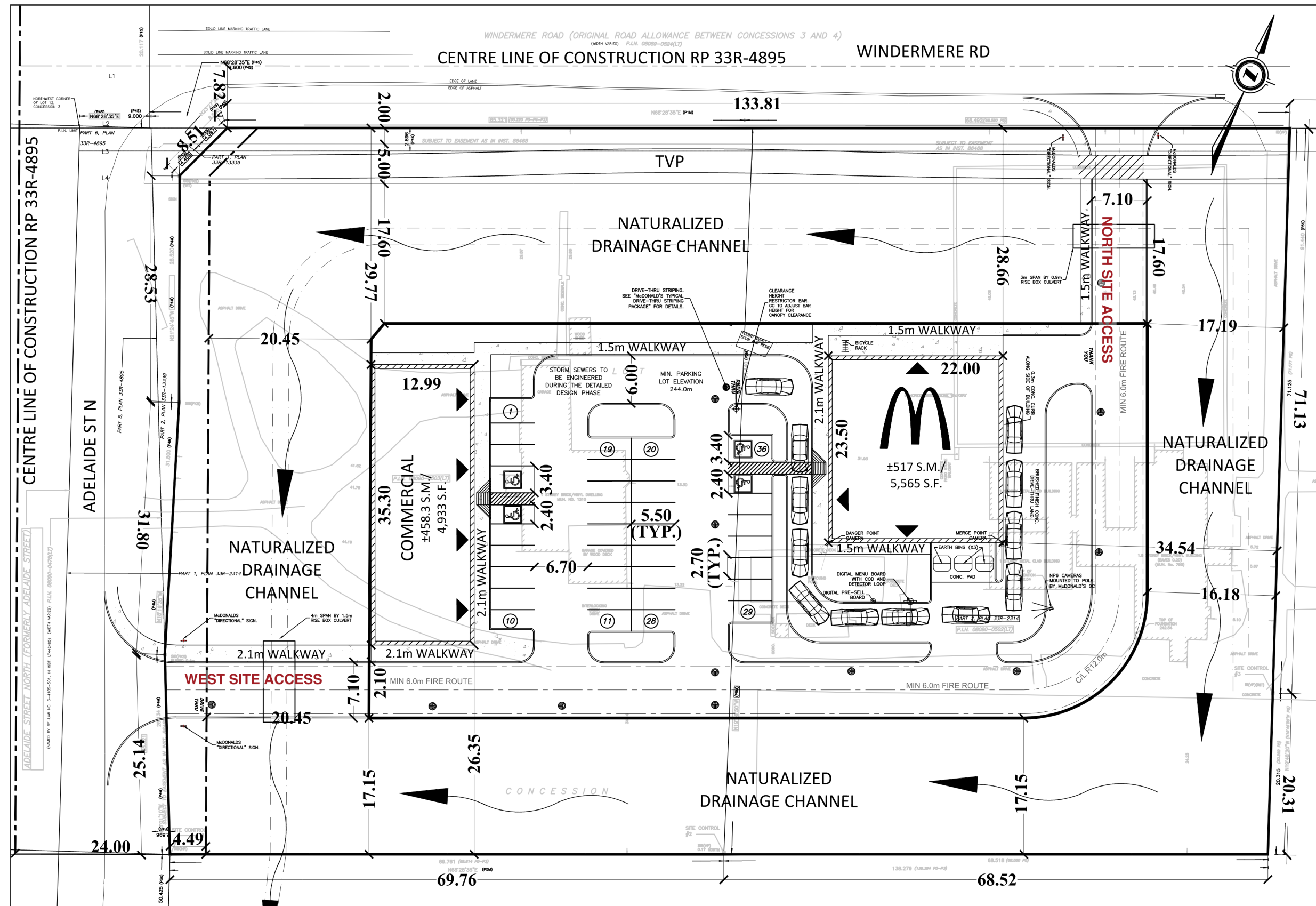
## **4 PROPOSED DEVELOPMENT**

### **4.1 DEVELOPMENT PLAN**

The proposed development will consist of two single-storey buildings with a total of approximately 975.3 m<sup>2</sup> of gross floor area. A cropped version of the Conceptual Site Plan is provided in Figure 7 and the full version of the drawing is included in Appendix C.

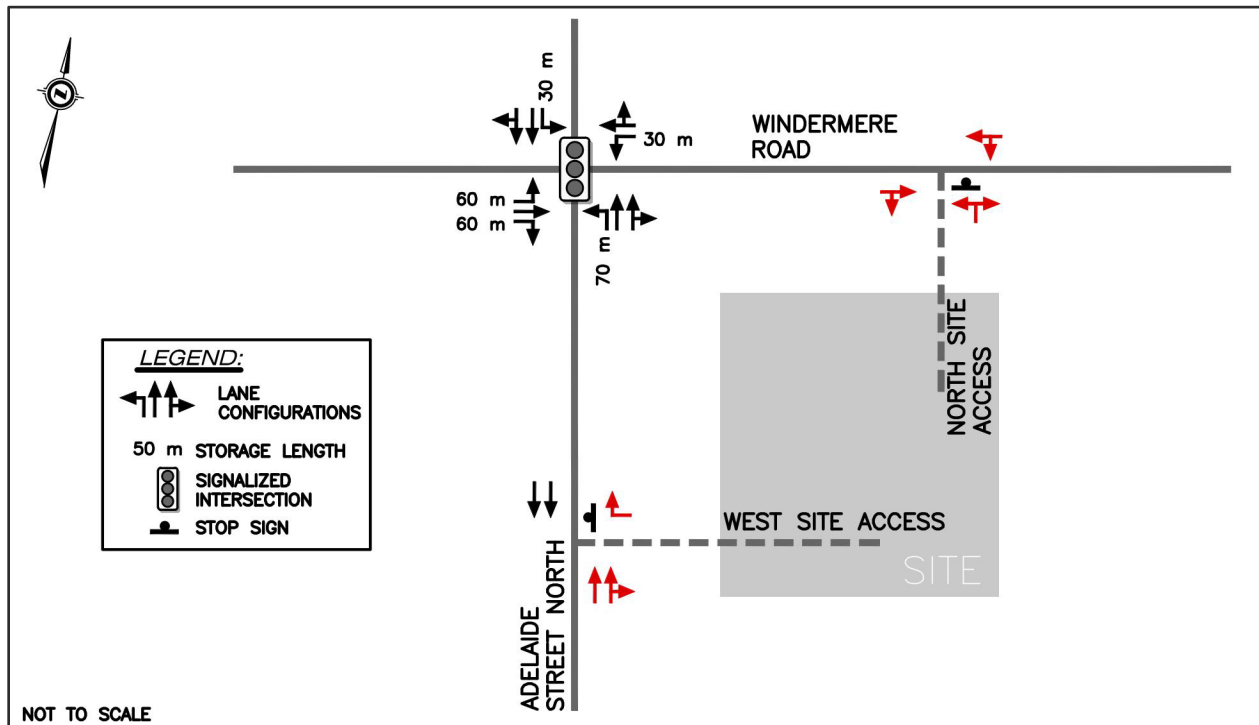
The buildings and parking lot will be centralized within the site in order to provide a required drainage channel around the perimeter of the site. The retail commercial building will be located on the west side of the site, which will have a gross floor area of 458.3 m<sup>2</sup> (4,933 ft<sup>2</sup>). The fast-food restaurant building (proposed McDonald's) will have a gross floor area of 517 m<sup>2</sup> (5,565 ft<sup>2</sup>) and be located on the east side of the site with the drive-through lane wrapping around the west, south, and east faces of the building.

Figure 7: Conceptual Site Plan



As shown on the Site Plan, two vehicular accesses are proposed; the North Site Access to Windermere Road and the West Site Access to Adelaide Street North. The North Site Access is proposed to allow movements in all directions and the West Site Access will be restricted to only right-in/right-out movements, as required by the City of London, which we expect will require extending the existing divisional island on Adelaide Street North from the Windermere Road intersection to 25 m south of the West Site Access to physically restrict left turn movements. The proposed lane configuration for the study area with the site accesses is shown in Figure 8.

**Figure 8: Proposed Lane Configuration**



#### 4.2 SITE TRAFFIC GENERATION AND DISTRIBUTION

Site generated traffic volumes from the proposed development have been estimated based on trip rate information contained in the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 11<sup>th</sup> Edition* (September 2021). For the retail commercial building, the “Strip Retail Plaza (<40k)” use (ITE Land Use Code 822) has been applied, and for the restaurant building, the “Fast Food Restaurant with Drive-Through” use (ITE Land Use Code 934) has been applied.

Reductions for internal interaction trips (i.e. trips that make stops at multiple facilities within a site) have been applied based on the data and methodology of ITE’s *Trip Generation Handbook, 3<sup>rd</sup> Edition* (September 2017). Pass-by trips (trips that are already using the adjacent road network and stop at the site since they are passing by) account for a large proportion of commercial traffic (especially for fast food restaurants), therefore pass-by trip rates (percentages) have also been applied.

The applicable unit quantities and resulting trip generation estimates for the uses described above are summarized in Table 5.

It is noted that no adjustments for non-auto mode trips have been applied.

**Table 5: Trip Generation Summary**

ITE LAND USE DESCRIPTION	APPLICABLE GFA	PM PEAK HOUR TRIPS			SAT PEAK HOUR TRIPS		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Strip Retail Plaza (<40k) LUC 822	4,933 ft <sup>2</sup>	24	23	47	16	16	32
Fast Food with Drive-Through LUC 934	5,565 ft <sup>2</sup>	96	88	184	157	150	307
<b>Gross Total Trips</b>		<b>120</b>	<b>111</b>	<b>231</b>	<b>173</b>	<b>166</b>	<b>339</b>
<b>Internal Interaction Reduction</b>							
Applied to all uses	16% PM 8% SAT	-19	-19	-38	-15	-15	-30
<b>Net External Trips</b>		<b>101</b>	<b>92</b>	<b>193</b>	<b>158</b>	<b>151</b>	<b>309</b>
<b>Pass-By Trips</b>							
Strip Retail Plaza (<40k) LUC 822	30% PM 30% SAT	-6	-6	-12	-5	-5	-10
Fast Food with Drive-Through LUC 934	50%	-39	-39	-78	-71	-71	-142
<b>Net New Trips</b>		<b>56</b>	<b>47</b>	<b>103</b>	<b>82</b>	<b>75</b>	<b>157</b>

As shown in Table 5, the new trip generation (two-way) for the proposed development is forecast to be 103 and 157 trips in the PM and Saturday peak hours, respectively.

The forecast development traffic has been distributed over the road network based on a combination of the existing traffic patterns in the area and expected origin/destinations. Table 6 summarizes the trip distribution applied in this study.

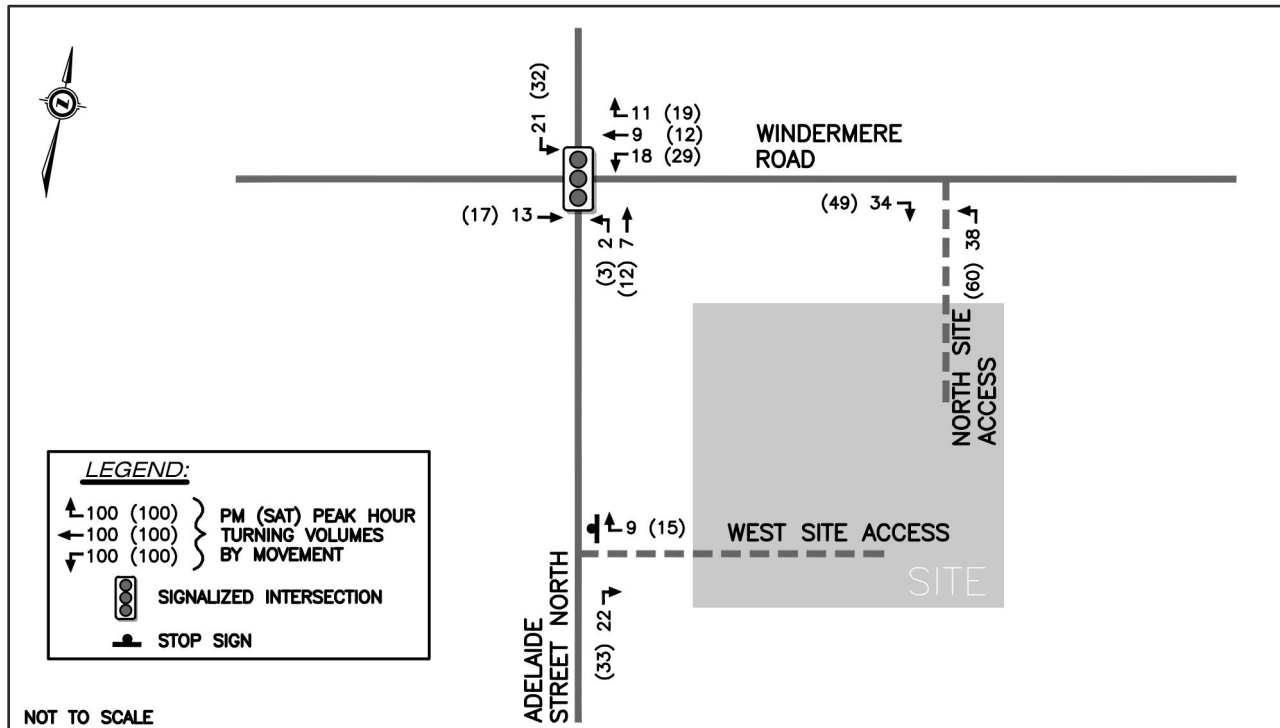
**Table 6: New Trip Distribution Summary**

DIRECTION TO / FROM	VIA	PM PEAK		SATURDAY PEAK	
		IN	OUT	IN	OUT
North	Adelaide Street North	38%	38%	40%	40%
South	Adelaide Street North	38%	38%	40%	40%
West	Windermere Road	24%	24%	20%	20%
<b>Total</b>		<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

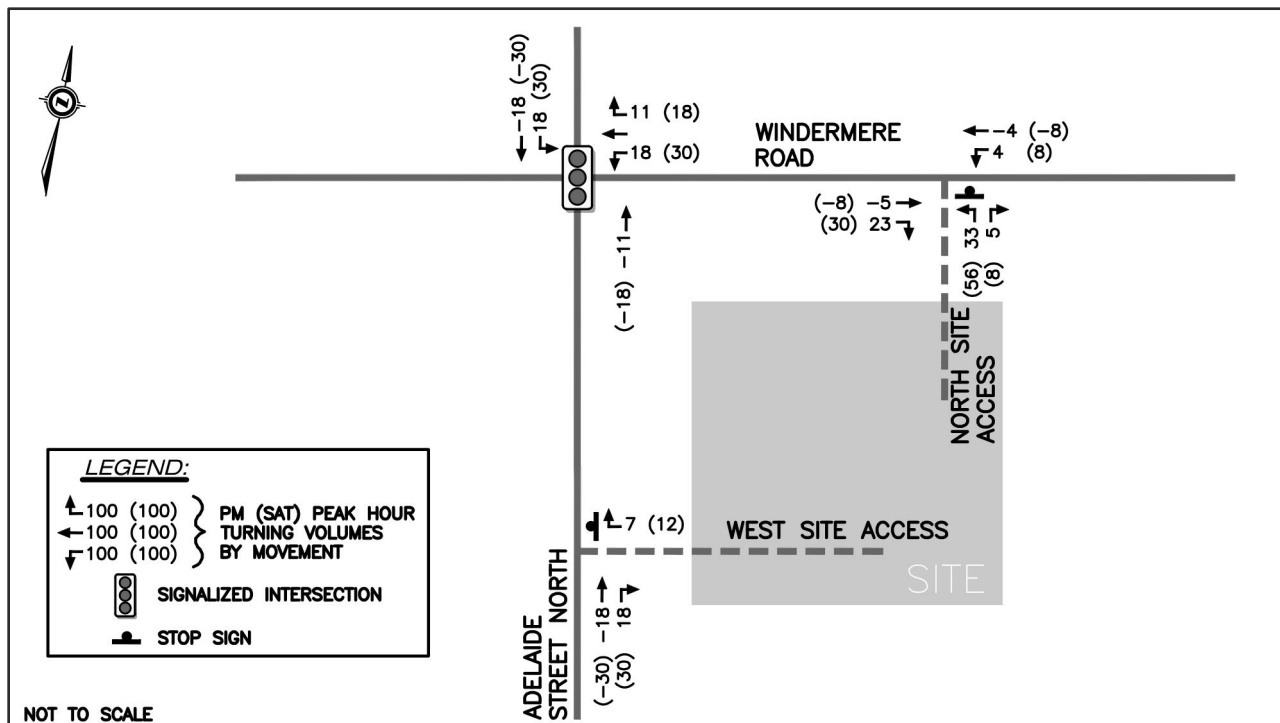
When assigning the site traffic to the site accesses, it was generally assumed that motorists will use the site access that provides the most direct route between their origin and destination. The pass-by traffic was broken down as 40% from northbound Adelaide Street North, 40% from southbound Adelaide Street North, 10% from eastbound Windermere Road and 10% from westbound Windermere Road based on proportions of existing traffic volumes travelling in these directions and considerations for ease of access.

The resulting site traffic from the proposed development is illustrated in Figure 9, Figure 10, and Figure 11 for new trips, pass-by trips and total trips, respectively.

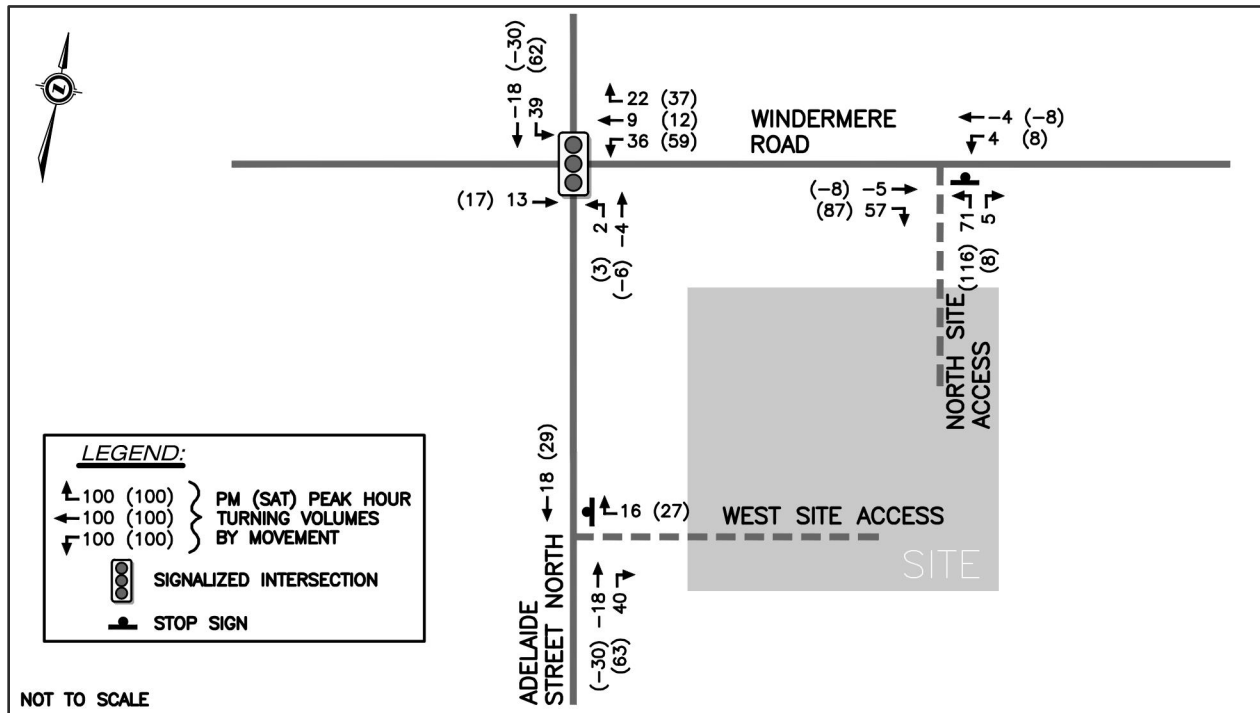
**Figure 9: Site Traffic - New**



**Figure 10: Site Traffic – Pass-By**



**Figure 11: Site Traffic - Total**



**4.2.1 SUPPLEMENTAL TRIP GENERATION INFORMATION FOR AM AND SUNDAY PEAK HOURS**

After the initial submission of this report, the City requested that trip generation information and site traffic figures be provided for the weekday AM peak hour and Sunday peak hour.

The AM and Sunday peak hour trip generation estimates for proposed development are summarized in Table 7.



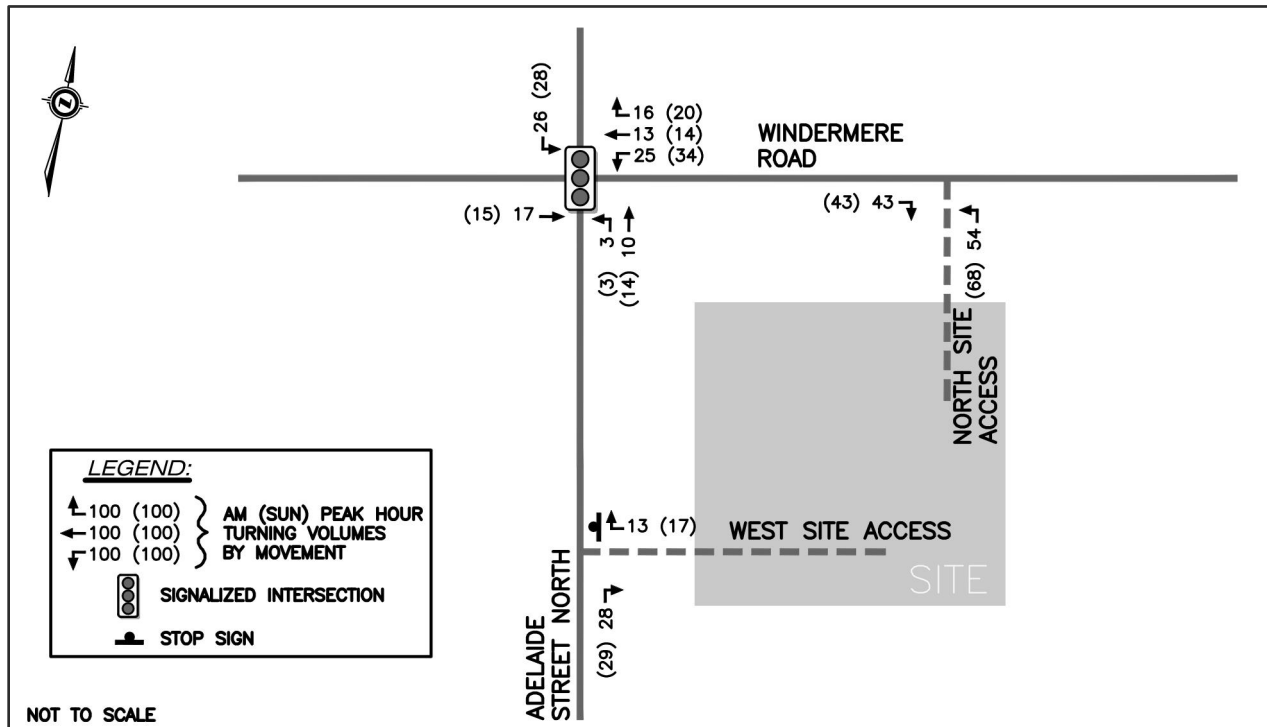
**Table 7: Weekday AM and Sunday Peak Hour Trip Generation Summary**

ITE LAND USE DESCRIPTION	APPLICABLE GFA	AM PEAK HOUR TRIPS			SUN PEAK HOUR TRIPS		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Strip Retail Plaza (<40k) LUC 822	4,933 ft <sup>2</sup>	9	9	18	13	13	26
Fast Food with Drive-Through LUC 934	5,565 ft <sup>2</sup>	126	122	248	147	160	307
<b>Gross Total Trips</b>		<b>135</b>	<b>131</b>	<b>266</b>	<b>160</b>	<b>173</b>	<b>333</b>
<b>Internal Interaction Reduction</b>							
Applied to all uses	2% AM 7% SUN	-3	-3	-6	-12	-12	-24
<b>Net External Trips</b>		<b>132</b>	<b>128</b>	<b>260</b>	<b>148</b>	<b>161</b>	<b>309</b>
<b>Pass-By Trips</b>							
Strip Retail Plaza (<40k) LUC 822	10% AM 30% SUN	-1	-1	-2	-4	-4	-8
Fast Food with Drive-Through LUC 934	49% AM 50% SUN	-60	-60	-120	-72	-72	-144
<b>Net New Trips</b>		<b>71</b>	<b>67</b>	<b>138</b>	<b>72</b>	<b>85</b>	<b>157</b>

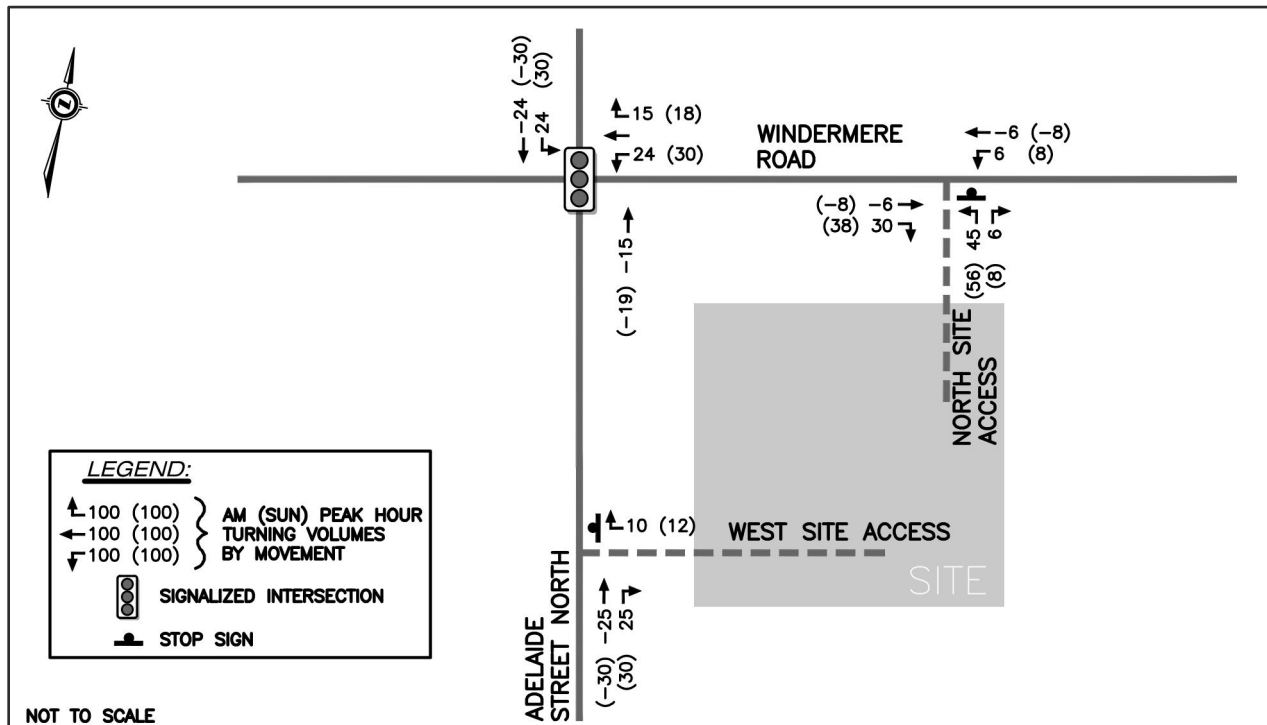
As shown in Table 7, the new trip generation (two-way) for the proposed development during the weekday AM and Sunday peak hours is forecast to be 138 and 157 trips, respectively.

Applying the same trip distribution from Table 6, the resulting AM and Sunday peak hour site traffic from the proposed development is illustrated in Figure 12, Figure 13, and Figure 14 for new trips, pass-by trips and total trips, respectively.

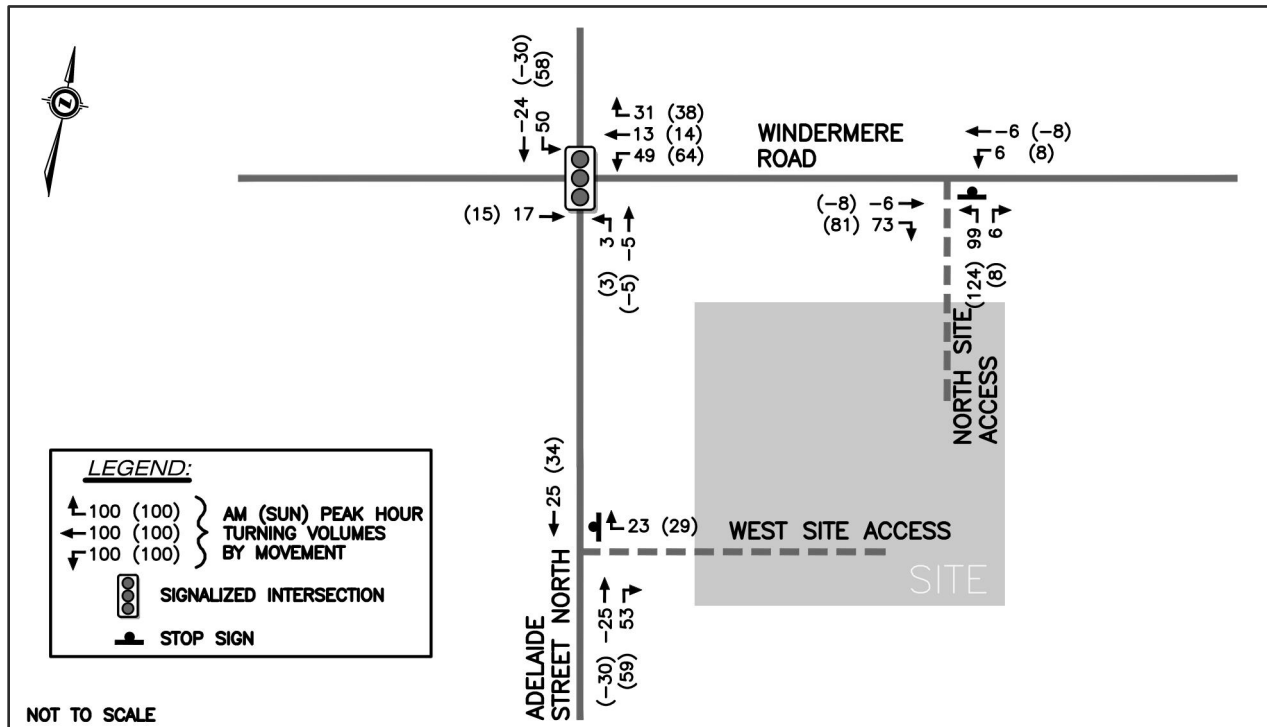
**Figure 12: AM and Sunday Peak Hour Site Traffic - New**



**Figure 13: AM and Sunday Peak Hour Site Traffic – Pass-By**



**Figure 14: AM and Sunday Peak Hour Site Traffic - Total**



### 4.3 SITE PLAN REVIEW AND ACCESS CONSIDERATIONS

#### 4.3.1 WEST SITE ACCESS CONSIDERATIONS

The proposed West Site Access is located on Adelaide Street North approximately 80 m south of Windermere Road (measured centerline to centerline). Sightlines at the West Site Access along Adelaide Street North are good and there are no sight obstructions in the boulevard, therefore we have no concerns about the West Site Access location.

The City of London Access Management Guidelines suggests that an exclusive right turn lane should be considered at an access when the volume of right turning vehicles is between 10 to 20 percent of the through volume, subject to a minimum of 60 vehicles per hour in the design hour.

Using the combination of the site traffic and 2029 background traffic (i.e. the 2029 total traffic, as presented later in Section 5), the maximum right turn volume into the site is 63 vehicles during the Saturday peak hour. Although this volume is above the 60 vehicles per hour minimum threshold, it represents less than 6% of the through volumes, therefore an inbound right turn lane is not needed at the West Site Access.

#### 4.3.2 NORTH SITE ACCESS CONSIDERATIONS

The proposed North Site Access is located on Windermere Road approximately 135 m east of Adelaide Street North (measured centerline to centerline). The access is proposed as a full movement driveway with one inbound lane and one outbound lane. Sightlines along Windermere Road are good and there are no sight obstructions within the boulevard.

### 4.3.3 PEDESTRIAN CONNECTIONS

A multi-use path is proposed along the north edge of the site which will connect to the sidewalk and in-boulevard cycling facility on Adelaide Street North. Sidewalk connections are proposed along the West Site Access and North Site Access to connect to the existing sidewalk on Adelaide Street North and the proposed multi-use path, respectively, which will provide good pedestrian access to the site.

### 4.4 TRANSPORTATION DEMAND MANAGEMENT (TDM)

Transportation Demand Management (TDM) refers to strategies for increasing the efficiency of the transportation network, most often by reducing the number of single-occupancy vehicle trips. The primary objectives are usually to encourage people to change modes of transportation (e.g. walking, cycling, or transit), travel less (e.g. work from home, combine trips when possible, etc.) or change trip times (i.e. avoid peak hours).

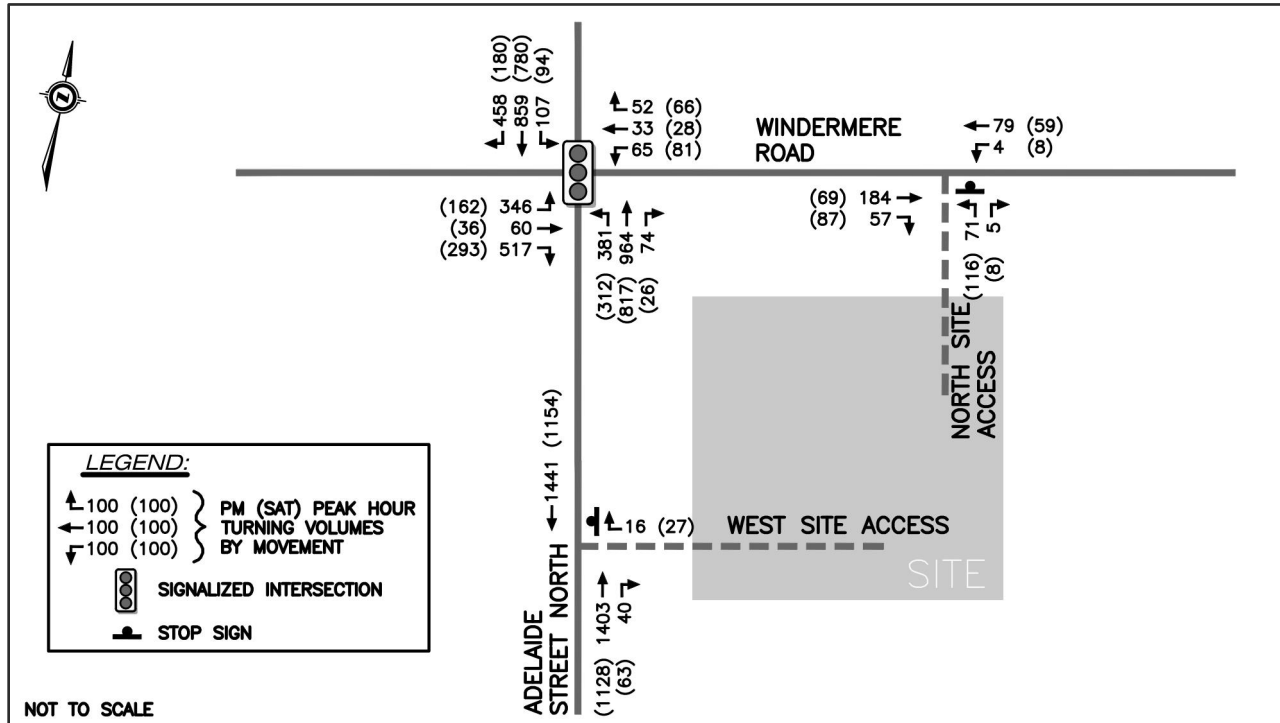
The proposed development supports TDM strategies in the following ways:

- The site design follows a “complete streets” approach with the commercial units addressing the street as much as possible and providing good pedestrian connections to encourage pedestrian activity.
- Appropriate parking provisions (i.e. not over-supplied) for the proposed uses may help promote the use of alternative modes.
- Adequate bicycle parking will be provided to promote cycling trips.
- Located in close proximity to bus stops to provide good transit access.

## 5 FUTURE TOTAL TRAFFIC

The total future traffic is determined by combining the development traffic (site traffic) from Section 4.2 with the future background traffic from Section 3.4. The resulting 2029 total traffic volumes for the weekday AM and PM peak hours are shown in Figure 15.

**Figure 15: 2029 Total Traffic Volumes**



## 6 FUTURE TRAFFIC OPERATIONAL ANALYSIS

Intersection operations were re-assessed for future background and total traffic conditions. The existing cycle lengths were maintained for the future conditions analysis, with only the splits being optimized as necessary. The results of the future conditions analysis are summarized in Table 8 with detailed Synchro reports for the future background traffic and future total traffic provided in Appendix D and Appendix E, respectively.

**Table 8: 2029 Intersection Operations Summary**

INTERSECTIONS / MOVEMENTS		2029 BACKGROUND				2029 TOTAL			
		PM PEAK HOUR		SAT PEAK HOUR		PM PEAK HOUR		SAT PEAK HOUR	
		V/C	LOS (DELAY)	V/C	LOS	V/C	LOS	V/C	LOS (DELAY)
Adelaide Street North and Windermere Road	Overall	<b>1.03</b>	<b>D</b>	<b>0.72</b>	<b>B</b>	<b>1.03</b>	<b>D</b>	<b>0.73</b>	<b>B</b>
	EB L	<b>0.99</b>	<b>F (83)</b>	0.71	D	<b>0.99</b>	<b>F (82)</b>	0.72	D
	EB T	0.09	C	0.06	D	0.12	C	0.12	D
	EB R	0.72	C	0.50	C	0.71	C	0.49	C
	WB L	0.08	C	0.09	D	0.18	C	0.34	D
	WB TR	0.07	C	0.07	D	0.10	C	0.14	D
	NB L	<b>1.01</b>	<b>F (82)</b>	0.70	B	<b>1.01</b>	<b>F (83)</b>	0.71	B
	NB TR	0.49	B	0.35	A	0.50	B	0.35	A
	SB L	0.36	C	0.10	B	0.57	D	0.30	B
SB TR	<b>0.99</b>	D	0.55	B	<b>0.99</b>	E	0.53	B	
Windermere Road and North Site Access	EB TR	N/A				0.15	A	0.10	A
	WB LT	N/A				0.07	A	0.05	A
	NB LR	N/A				0.11	B	0.16	B
Adelaide Street North and West Site Access	WB R	N/A				0.05	C	0.07	B
	NB TR	N/A				0.58	A	0.47	A
	SB T	N/A				0.45	A	0.36	A
<b>Notes:</b> V/C - Volume to Capacity Ratio, LOS – Level of Service, Delay – Average Delay Per Vehicle in Seconds EB – Eastbound, WB – Westbound, NB – Northbound, SB - Southbound L – Left, T – Through, R – Right									

As shown in the results above, under 2029 background traffic conditions, the eastbound left turn, northbound left turn, and southbound through movements at the Adelaide Street North and Windermere Road intersection reach capacity (v/c ratios between 0.99 and 1.01) during the PM peak hour. The 2029 total traffic results show that v/c ratios for the critical movements stay identical to the background traffic values, with all other movements operating acceptably, indicating that the addition of the site traffic will have a negligible impact on the operation of the Adelaide Street North and Windermere Road intersection.

Both the Adelaide Street North and West Site Access, and the Windermere Road and North Site Access intersections will function well with movements at LOS B or better.



Queuing results for the 2029 background and total traffic conditions were reviewed from the Synchro analysis to compare 95<sup>th</sup> percentile queue with the available storage lengths and the results are presented in Table 9.

**Table 9: 2029 Intersection Queuing Summary**

INTERSECTIONS / MOVEMENTS		AVAILABLE STORAGE (m)	95 <sup>th</sup> PERCENTILE QUEUE (m)			
			2029 BACKGROUND		2029 TOTAL	
			PM	SAT	PM	SAT
Adelaide Street North and Windermere Road	EB L	60	<b>137</b>	53	<b>137</b>	53
	EB T	-	17	9	21	15
	EB R	60	<b>112</b>	51	<b>110</b>	50
	WB L	30	12	10	22	28
	WB TR	-	14	12	17	18
	NB L	70	<b>131</b>	54	<b>132</b>	52
	NB TR	-	77	55	79	56
	SB L	30	24	11	<b>40</b>	29
	SB TR	-	198	112	197	107
Windermere Road and North Site Access	NB LR	25	N/A		<5	<5
Adelaide Street North and West Site Access	WB R	50	N/A		<5	<5
<b>Notes:</b> EB – Eastbound, WB – Westbound, NB – Northbound, SB – Southbound L – Left, T – Through, R – Right						

The queuing results at the Adelaide Street North and Windermere Road intersection for the 2029 background traffic are fairly similar to the existing conditions with the same PM peak hour critical movements just having longer queues. The key observation from Table 9 is that the queue lengths for the critical movements under 2029 total traffic conditions are essentially identical to 2029 background condition, indicating that the site traffic does not exacerbate the existing queuing issues. Under 2029 total traffic conditions, the queue for the southbound left turn lane is expected to extend approximately 10 m beyond the available storage, however, this would be for only a brief time and can likely be accommodated within the left turn lane taper so no significant blockage of the southbound through lane is expected.

There are no queuing concerns at the proposed site access intersections.

## 7 CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis completed, the following key conclusions and recommendations are made in this TIA:

- It is forecast that the proposed development will generate 103 new trips in the PM peak hour (56 in and 47 out) and 157 new trips during the Saturday peak hour (82 in and 75 out).
- Under existing conditions, the Adelaide Street North and Windermere Road intersection is operating at a higher v/c ratio (overall 0.91) during the PM peak hour with the eastbound left turn movement at LOS E with queuing that extends beyond the left turn lane and occasionally blocks access to the through and right turn lane, therefore the City may wish to monitor the intersection operations to assess whether extension of the eastbound left turn lane is warranted. The Saturday peak hour operates well.
- Under 2029 background traffic conditions, the eastbound left turn, northbound left turn, and southbound through movements at the Adelaide Street North and Windermere Road intersection reach capacity (v/c ratios between 0.99 and 1.01) during the PM peak hour, and the eastbound and northbound turn lane queues will extend beyond their available storage lengths and occasionally block through traffic.
- Under 2029 total traffic conditions, the critical movements at the Adelaide Street North and Windermere Road intersection remain identical to the background traffic operations, and all other movements operate acceptably, which indicates that the site traffic from the proposed development will have no significant impact on the intersection operations. The only potential impact is to the queue length for the southbound left turn movement since the results show that the future queue may extend up to 10 m beyond the available storage lane length, however, this would be for only a brief time and can likely be accommodated within the left turn lane taper so no significant blockage of the southbound through lane is expected.
- Both site accesses are expected to operate well and there are no concerns about the access locations.
- The need for a right turn lane on Adelaide Street North at the West Site Access was considered with respect to the City of London Access Management Guidelines and it was concluded that the turning volumes are not high enough to warrant a right turn lane.
- The proposed multi-use path along the north edge of the site and the proposed sidewalk connections at both site accesses will provide good pedestrian access to the site.
- Other than the extension of the divisional island on Adelaide Street North to physically restrict left turn movements at the West Site Access, no improvements to the external road network are required to accommodate the proposed development.

## **8** **LIMITATIONS**

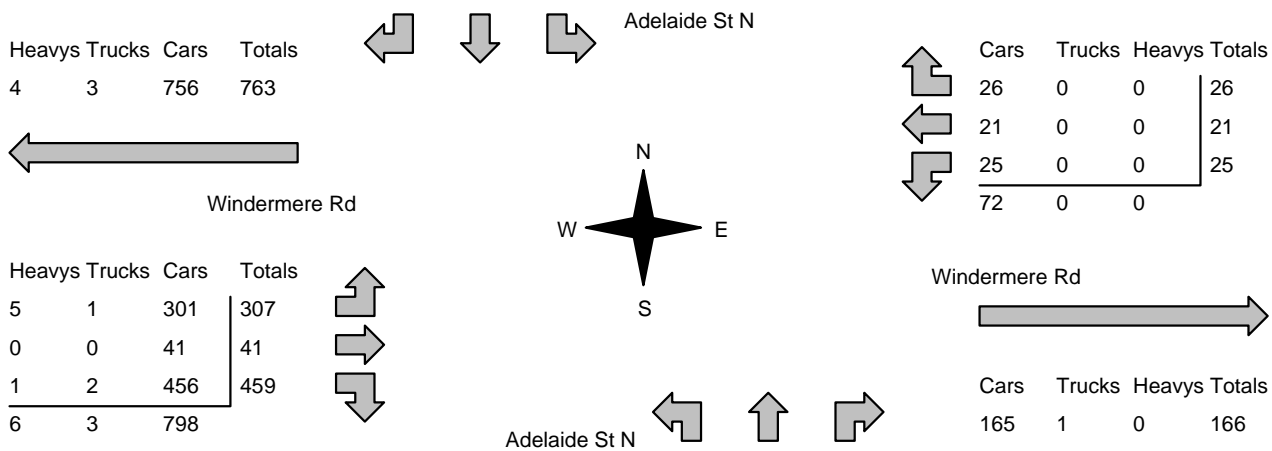
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The analysis was limited to the documents referenced herein. Strik, Baldinelli, Moniz Ltd. accepts no responsibility for the accuracy of the information provided by others. All opinions, conclusions, and/or recommendations presented in this Report are based on the information available at the time of the review.

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## **Appendix A – Traffic Data & Signal Timing Plans**

<b>Afternoon Peak Diagram</b>		<b>Specified Period</b> <b>From:</b> 16:00:00 <b>To:</b> 20:00:00	<b>One Hour Peak</b> <b>From:</b> 17:15:00 <b>To:</b> 18:15:00																												
<b>Municipality:</b> London <b>Site #:</b> 2317000001 <b>Intersection:</b> Adelaide St N & Windermere Rd <b>TFR File #:</b> 1 <b>Count date:</b> 5-Jul-23		<b>Weather conditions:</b>  <b>Person counted:</b> <b>Person prepared:</b> <b>Person checked:</b>																													
<b>** Signalized Intersection **</b>		<b>Major Road:</b> Adelaide St N runs N/S																													
North Leg Total: 2436 North Entering: 1244 North Peds: 10 Peds Cross: $\boxtimes$	<table style="width:100%; border-collapse: collapse;"> <tr><td>Heavys</td><td>1</td><td>8</td><td>0</td><td>9</td></tr> <tr><td>Trucks</td><td>3</td><td>10</td><td>0</td><td>13</td></tr> <tr><td>Cars</td><td>402</td><td>760</td><td>60</td><td>1222</td></tr> <tr><td>Totals</td><td>406</td><td>778</td><td>60</td><td></td></tr> </table>	Heavys	1	8	0	9	Trucks	3	10	0	13	Cars	402	760	60	1222	Totals	406	778	60		<table style="width:100%; border-collapse: collapse;"> <tr><td>Heavys</td><td>15</td></tr> <tr><td>Trucks</td><td>8</td></tr> <tr><td>Cars</td><td>1169</td></tr> <tr><td>Totals</td><td>1192</td></tr> </table>	Heavys	15	Trucks	8	Cars	1169	Totals	1192	East Leg Total: 238 East Entering: 72 East Peds: 2 Peds Cross: $\boxtimes$
Heavys	1	8	0	9																											
Trucks	3	10	0	13																											
Cars	402	760	60	1222																											
Totals	406	778	60																												
Heavys	15																														
Trucks	8																														
Cars	1169																														
Totals	1192																														
																															
<table style="width:100%; border-collapse: collapse;"> <tr><td>Heavys</td><td>Trucks</td><td>Cars</td><td>Totals</td></tr> <tr><td>4</td><td>3</td><td>756</td><td>763</td></tr> </table>	Heavys	Trucks	Cars	Totals	4	3	756	763		<table style="width:100%; border-collapse: collapse;"> <tr><td>Cars</td><td>Trucks</td><td>Heavys</td><td>Totals</td></tr> <tr><td>26</td><td>0</td><td>0</td><td>26</td></tr> <tr><td>21</td><td>0</td><td>0</td><td>21</td></tr> <tr><td>25</td><td>0</td><td>0</td><td>25</td></tr> <tr><td>72</td><td>0</td><td>0</td><td></td></tr> </table>	Cars	Trucks	Heavys	Totals	26	0	0	26	21	0	0	21	25	0	0	25	72	0	0		
Heavys	Trucks	Cars	Totals																												
4	3	756	763																												
Cars	Trucks	Heavys	Totals																												
26	0	0	26																												
21	0	0	21																												
25	0	0	25																												
72	0	0																													
<table style="width:100%; border-collapse: collapse;"> <tr><td>Heavys</td><td>Trucks</td><td>Cars</td><td>Totals</td></tr> <tr><td>5</td><td>1</td><td>301</td><td>307</td></tr> <tr><td>0</td><td>0</td><td>41</td><td>41</td></tr> <tr><td>1</td><td>2</td><td>456</td><td>459</td></tr> <tr><td>6</td><td>3</td><td>798</td><td></td></tr> </table>	Heavys	Trucks	Cars	Totals	5	1	301	307	0	0	41	41	1	2	456	459	6	3	798				<table style="width:100%; border-collapse: collapse;"> <tr><td>Cars</td><td>Trucks</td><td>Heavys</td><td>Totals</td></tr> <tr><td>165</td><td>1</td><td>0</td><td>166</td></tr> </table>	Cars	Trucks	Heavys	Totals	165	1	0	166
Heavys	Trucks	Cars	Totals																												
5	1	301	307																												
0	0	41	41																												
1	2	456	459																												
6	3	798																													
Cars	Trucks	Heavys	Totals																												
165	1	0	166																												
Peds Cross: $\boxtimes$ West Peds: 7 West Entering: 807 West Leg Total: 1570	<table style="width:100%; border-collapse: collapse;"> <tr><td>Cars</td><td>1241</td></tr> <tr><td>Trucks</td><td>12</td></tr> <tr><td>Heavys</td><td>9</td></tr> <tr><td>Totals</td><td>1262</td></tr> </table>	Cars	1241	Trucks	12	Heavys	9	Totals	1262	<table style="width:100%; border-collapse: collapse;"> <tr><td>Cars</td><td>333</td><td>842</td><td>64</td><td>1239</td></tr> <tr><td>Trucks</td><td>0</td><td>7</td><td>1</td><td>8</td></tr> <tr><td>Heavys</td><td>3</td><td>10</td><td>0</td><td>13</td></tr> <tr><td>Totals</td><td>336</td><td>859</td><td>65</td><td></td></tr> </table>	Cars	333	842	64	1239	Trucks	0	7	1	8	Heavys	3	10	0	13	Totals	336	859	65		Peds Cross: $\boxtimes$ South Peds: 17 South Entering: 1260 South Leg Total: 2522
Cars	1241																														
Trucks	12																														
Heavys	9																														
Totals	1262																														
Cars	333	842	64	1239																											
Trucks	0	7	1	8																											
Heavys	3	10	0	13																											
Totals	336	859	65																												
<b>Comments</b>																															

# Total Count Diagram

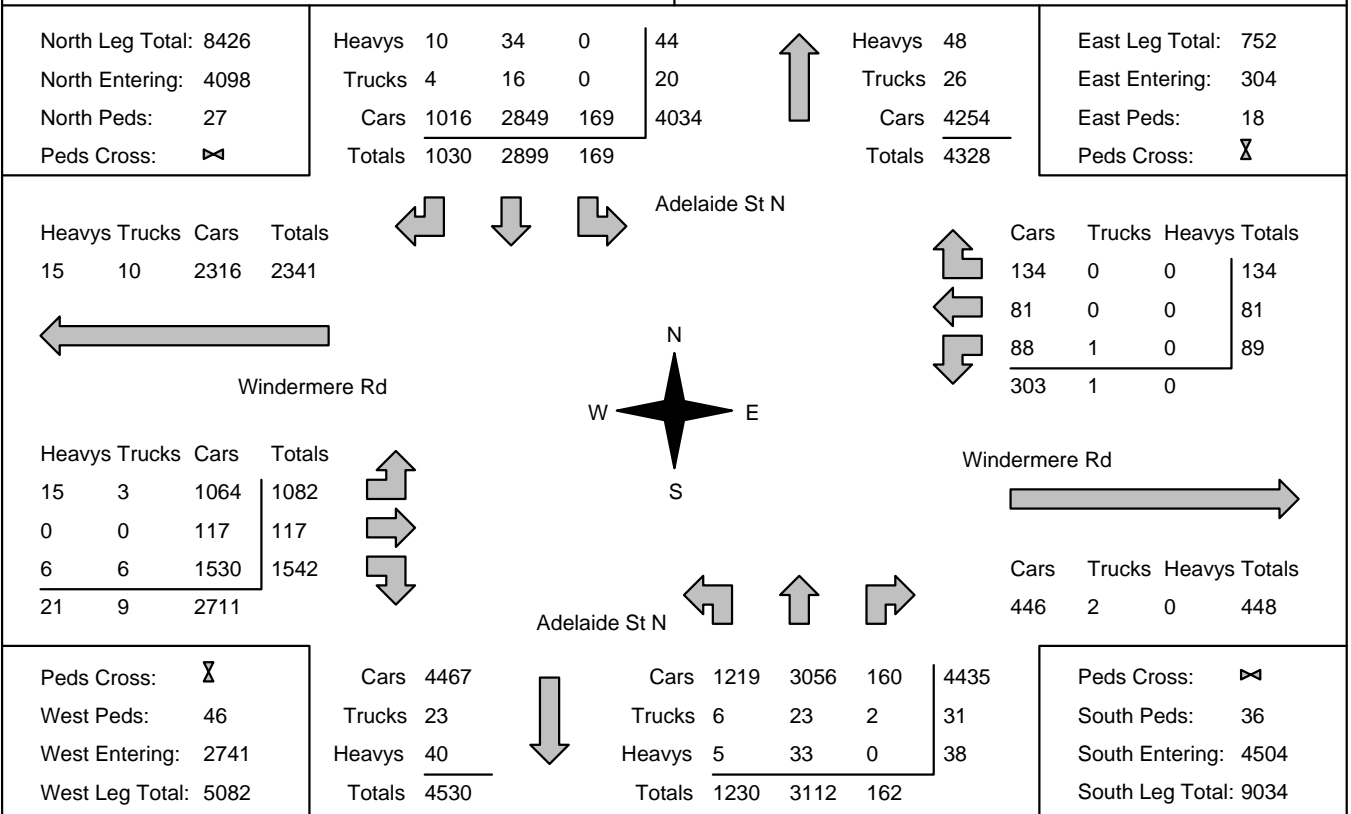
**Municipality:** London  
**Site #:** 2317000001  
**Intersection:** Adelaide St N & Windermere Rd  
**TFR File #:** 1  
**Count date:** 5-Jul-23

**Weather conditions:**

**Person counted:**  
**Person prepared:**  
**Person checked:**

**\*\* Signalized Intersection \*\***

**Major Road:** Adelaide St N runs N/S



## Comments



# Traffic Count Summary

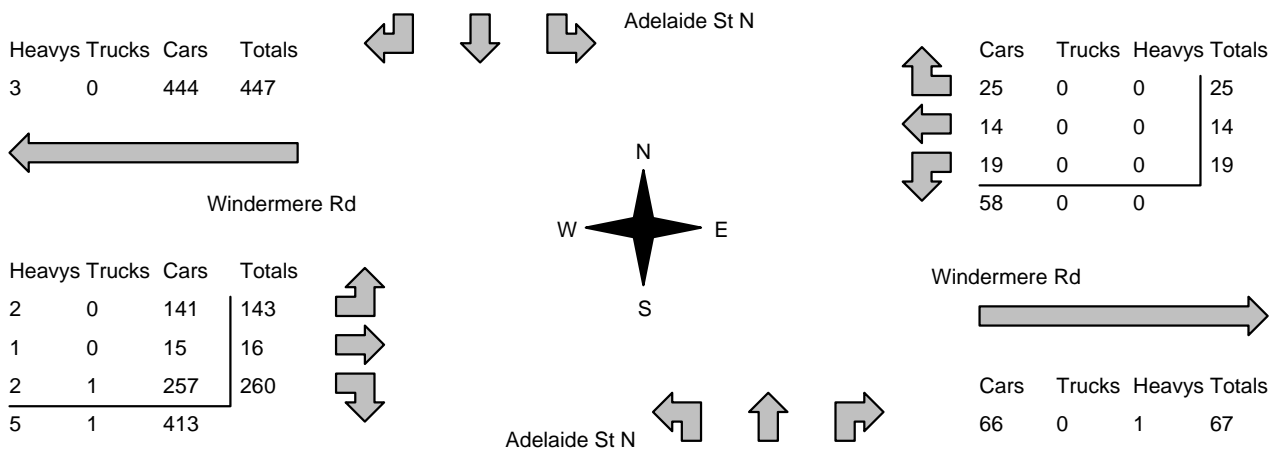
Intersection: Adelaide St N & Windermere Rd					Count Date: 5-Jul-23		Municipality: London					
North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	28	756	230	1014	12	2257	17:00:00	282	932	29	1243	2
18:00:00	55	787	355	1197	11	2487	18:00:00	325	907	58	1290	2
19:00:00	43	777	295	1115	2	2146	19:00:00	345	651	35	1031	19
20:00:00	43	579	150	772	2	1712	20:00:00	278	622	40	940	13
<b>Totals:</b>	<b>169</b>	<b>2899</b>	<b>1030</b>	<b>4098</b>	<b>27</b>	<b>8602</b>	<b>S Totals:</b>	<b>1230</b>	<b>3112</b>	<b>162</b>	<b>4504</b>	<b>36</b>
East Approach Totals						East/West Total Approaches	West Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	16	21	30	67	12	889	17:00:00	370	28	424	822	10
18:00:00	27	20	27	74	4	895	18:00:00	338	40	443	821	10
19:00:00	16	11	33	60	1	634	19:00:00	191	22	361	574	9
20:00:00	30	29	44	103	1	627	20:00:00	183	27	314	524	17
<b>Totals:</b>	<b>89</b>	<b>81</b>	<b>134</b>	<b>304</b>	<b>18</b>	<b>3045</b>	<b>W Totals:</b>	<b>1082</b>	<b>117</b>	<b>1542</b>	<b>2741</b>	<b>46</b>
<b>Calculated Values for Traffic Crossing Major Street</b>												
Hours Ending:	16:00	17:00	18:00	19:00		20:00	0:00	0:00	0:00			
Crossing Values:	0	428	418	250		257	0	0	0			









<b>Mid-day Peak Diagram</b>		<b>Specified Period</b> <b>From:</b> 10:00:00 <b>To:</b> 14:00:00	<b>One Hour Peak</b> <b>From:</b> 12:00:00 <b>To:</b> 13:00:00																												
<b>Municipality:</b> London <b>Site #:</b> 2317000001 <b>Intersection:</b> Adelaide St N & Windermere Rd <b>TFR File #:</b> 1 <b>Count date:</b> 8-Jul-23		<b>Weather conditions:</b>  <b>Person counted:</b> <b>Person prepared:</b> <b>Person checked:</b>																													
<b>** Signalized Intersection **</b>		<b>Major Road:</b> Adelaide St N runs N/S																													
North Leg Total: 1804 North Entering: 906 North Peds: 1 Peds Cross: ☒	<table style="width:100%; border-collapse: collapse;"> <tr><td>Heavys</td><td>2</td><td>6</td><td>0</td><td>8</td></tr> <tr><td>Trucks</td><td>0</td><td>4</td><td>0</td><td>4</td></tr> <tr><td>Cars</td><td>157</td><td>709</td><td>28</td><td>894</td></tr> <tr><td>Totals</td><td>159</td><td>719</td><td>28</td><td></td></tr> </table>	Heavys	2	6	0	8	Trucks	0	4	0	4	Cars	157	709	28	894	Totals	159	719	28		<table style="width:100%; border-collapse: collapse;"> <tr><td>Heavys</td><td>6</td></tr> <tr><td>Trucks</td><td>2</td></tr> <tr><td>Cars</td><td>890</td></tr> <tr><td>Totals</td><td>898</td></tr> </table>	Heavys	6	Trucks	2	Cars	890	Totals	898	East Leg Total: 125 East Entering: 58 East Peds: 6 Peds Cross: ☒
Heavys	2	6	0	8																											
Trucks	0	4	0	4																											
Cars	157	709	28	894																											
Totals	159	719	28																												
Heavys	6																														
Trucks	2																														
Cars	890																														
Totals	898																														
																															
<table style="width:100%; border-collapse: collapse;"> <tr><td>Heavys</td><td>Trucks</td><td>Cars</td><td>Totals</td></tr> <tr><td>3</td><td>0</td><td>444</td><td>447</td></tr> </table>	Heavys	Trucks	Cars	Totals	3	0	444	447		<table style="width:100%; border-collapse: collapse;"> <tr><td>Cars</td><td>Trucks</td><td>Heavys</td><td>Totals</td></tr> <tr><td>25</td><td>0</td><td>0</td><td>25</td></tr> <tr><td>14</td><td>0</td><td>0</td><td>14</td></tr> <tr><td>19</td><td>0</td><td>0</td><td>19</td></tr> <tr><td>58</td><td>0</td><td>0</td><td></td></tr> </table>	Cars	Trucks	Heavys	Totals	25	0	0	25	14	0	0	14	19	0	0	19	58	0	0		
Heavys	Trucks	Cars	Totals																												
3	0	444	447																												
Cars	Trucks	Heavys	Totals																												
25	0	0	25																												
14	0	0	14																												
19	0	0	19																												
58	0	0																													
<table style="width:100%; border-collapse: collapse;"> <tr><td>Heavys</td><td>Trucks</td><td>Cars</td><td>Totals</td></tr> <tr><td>2</td><td>0</td><td>141</td><td>143</td></tr> <tr><td>1</td><td>0</td><td>15</td><td>16</td></tr> <tr><td>2</td><td>1</td><td>257</td><td>260</td></tr> <tr><td>5</td><td>1</td><td>413</td><td></td></tr> </table>	Heavys	Trucks	Cars	Totals	2	0	141	143	1	0	15	16	2	1	257	260	5	1	413				<table style="width:100%; border-collapse: collapse;"> <tr><td>Cars</td><td>Trucks</td><td>Heavys</td><td>Totals</td></tr> <tr><td>66</td><td>0</td><td>1</td><td>67</td></tr> </table>	Cars	Trucks	Heavys	Totals	66	0	1	67
Heavys	Trucks	Cars	Totals																												
2	0	141	143																												
1	0	15	16																												
2	1	257	260																												
5	1	413																													
Cars	Trucks	Heavys	Totals																												
66	0	1	67																												
Peds Cross: ☒ West Peds: 13 West Entering: 419 West Leg Total: 866	<table style="width:100%; border-collapse: collapse;"> <tr><td>Cars</td><td>985</td></tr> <tr><td>Trucks</td><td>5</td></tr> <tr><td>Heavys</td><td>8</td></tr> <tr><td>Totals</td><td>998</td></tr> </table>	Cars	985	Trucks	5	Heavys	8	Totals	998	<table style="width:100%; border-collapse: collapse;"> <tr><td>Cars</td><td>273</td><td>724</td><td>23</td><td>1020</td></tr> <tr><td>Trucks</td><td>0</td><td>2</td><td>0</td><td>2</td></tr> <tr><td>Heavys</td><td>1</td><td>4</td><td>0</td><td>5</td></tr> <tr><td>Totals</td><td>274</td><td>730</td><td>23</td><td></td></tr> </table>	Cars	273	724	23	1020	Trucks	0	2	0	2	Heavys	1	4	0	5	Totals	274	730	23		Peds Cross: ☒ South Peds: 4 South Entering: 1027 South Leg Total: 2025
Cars	985																														
Trucks	5																														
Heavys	8																														
Totals	998																														
Cars	273	724	23	1020																											
Trucks	0	2	0	2																											
Heavys	1	4	0	5																											
Totals	274	730	23																												
<b>Comments</b>																															

# Total Count Diagram

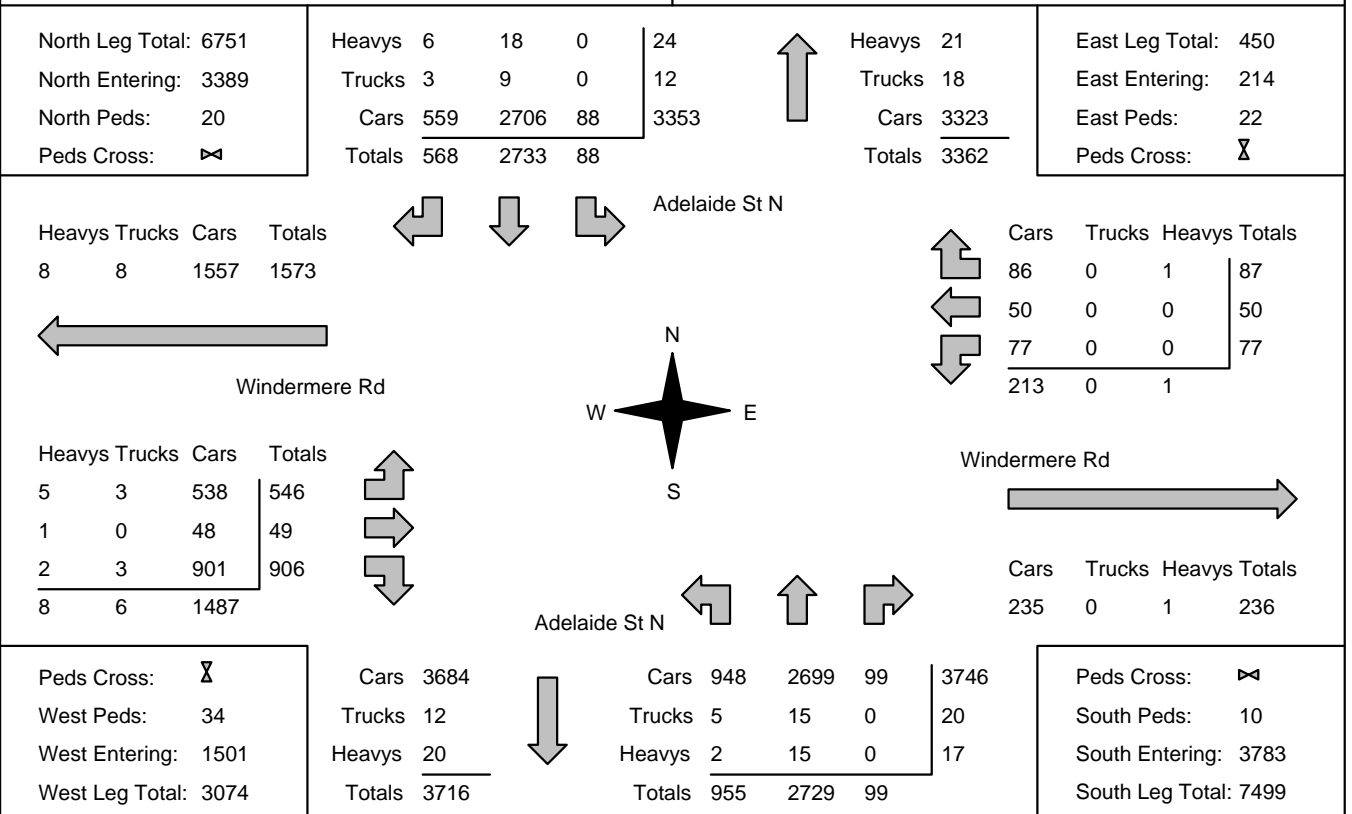
**Municipality:** London  
**Site #:** 2317000001  
**Intersection:** Adelaide St N & Windermere Rd  
**TFR File #:** 1  
**Count date:** 8-Jul-23

**Weather conditions:**

**Person counted:**  
**Person prepared:**  
**Person checked:**

**\*\* Signalized Intersection \*\***

**Major Road:** Adelaide St N runs N/S



## Comments

# Traffic Count Summary

Intersection: Adelaide St N & Windermere Rd      Count Date: 8-Jul-23      Municipality: London

North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
10:00:00	0	0	0	0	0	0	10:00:00	0	0	0	0	0
11:00:00	29	621	128	778	3	1543	11:00:00	194	546	25	765	0
12:00:00	22	713	125	860	10	1840	12:00:00	226	725	29	980	4
13:00:00	28	719	159	906	1	1933	13:00:00	274	730	23	1027	4
14:00:00	9	680	156	845	6	1856	14:00:00	261	728	22	1011	2
<b>Totals:</b>	<b>88</b>	<b>2733</b>	<b>568</b>	<b>3389</b>	<b>20</b>	<b>7172</b>	<b>S Totals:</b>	<b>955</b>	<b>2729</b>	<b>99</b>	<b>3783</b>	<b>10</b>
East Approach Totals						East/West Total Approaches	West Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
10:00:00	0	0	0	0	0	0	10:00:00	0	0	0	0	0
11:00:00	18	12	18	48	7	423	11:00:00	136	12	227	375	6
12:00:00	19	9	20	48	5	374	12:00:00	115	10	201	326	8
13:00:00	19	14	25	58	6	477	13:00:00	143	16	260	419	13
14:00:00	21	15	24	60	4	441	14:00:00	152	11	218	381	7
<b>Totals:</b>	<b>77</b>	<b>50</b>	<b>87</b>	<b>214</b>	<b>22</b>	<b>1715</b>	<b>W Totals:</b>	<b>546</b>	<b>49</b>	<b>906</b>	<b>1501</b>	<b>34</b>
<b>Calculated Values for Traffic Crossing Major Street</b>												
Hours Ending:	10:00	11:00	12:00	13:00		14:00	0:00	0:00	0:00			
Crossing Values:	0	169	158	183		196	0	0	0			













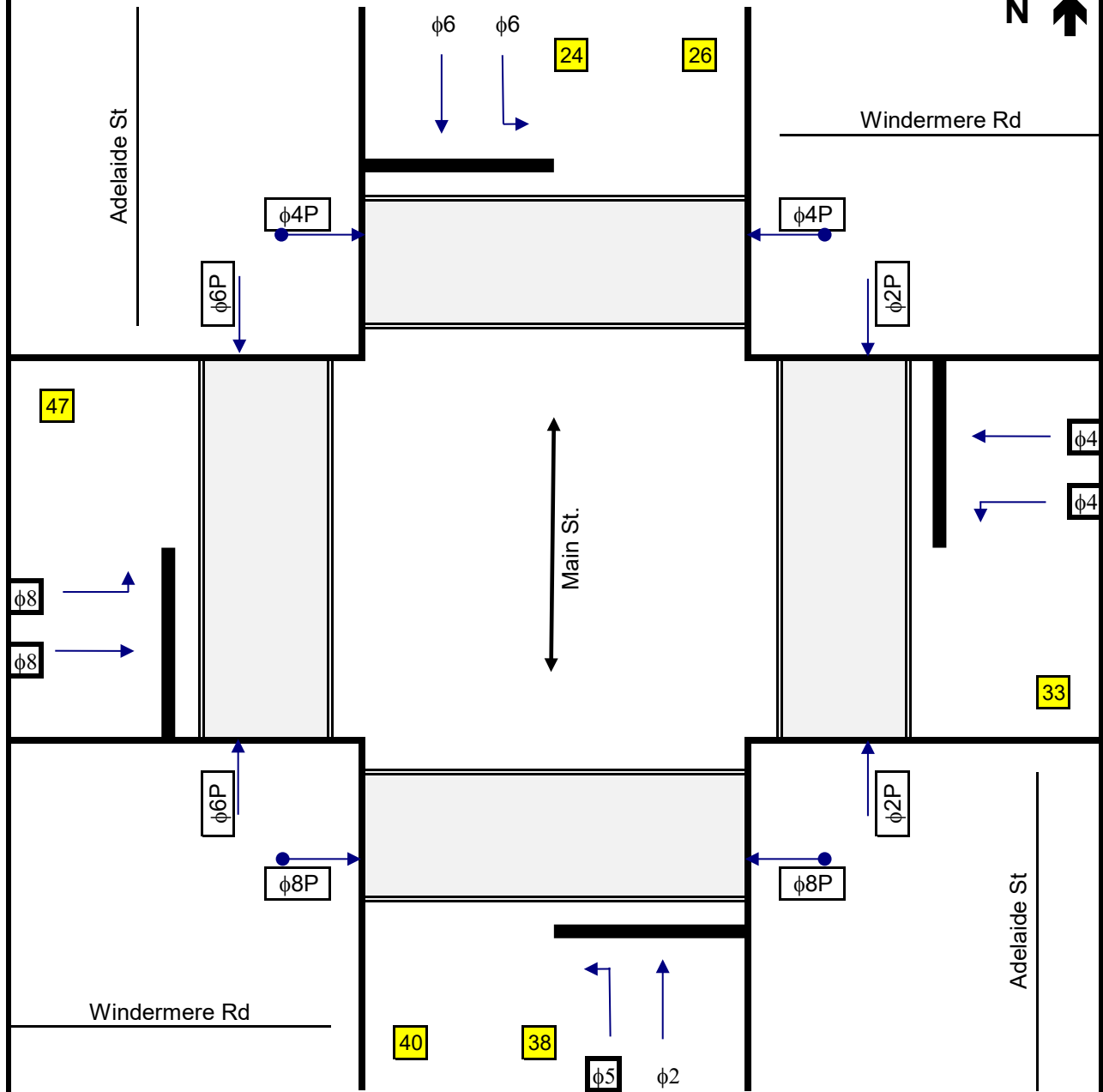
# PHASING OPERATION FORM

Int. #: 212

Date: 7/6/2021

Location: Windermere Rd @ Adelaide St

Name: S. Jogie



### Phase Sequencing

φ1	φ2	φ3	φ4
φ5	φ6	φ7	φ8

- Pedestrian Phase
- Permissive Phase
- Protected Phase

### Pre-emption

φ	1	2	3	4	5	6	7	8
PE1		■		■		■		■
PE2		■		■		■		■
PE3								
PE4								

- Pre-emption Phase(s)
- Exit Phase(s)

Operation: Semi

Force Mode: Cycle

Perm. Strat: Auto

Correction: SW

OL1:

OL2:

OL3:

Detection:

Ped. Button:

Spec. Detector:

Notes:



# Signal Timing Report

Printed: 2023-03-12 19:00:31

RunTime:2023-03-12 19:00:31



Intersection ID: **212: Windermere Road/Adelaide Street N**

Operator:

Date Modified:

Deployed date:

Date of last edit:

**ADMIN**

**2022-08-10 13:15:01.697**

**2022-08-10 13:15:01.697**

**2022-08-10 13:15:01.697**

A.2 IP address: **10.51.0.249**

Port: **1001**

v 1.01

### A.3 Communications Timeout

COMM TIMEOUT: **4000**

OPERATIONS MODE: **Automatic**

### 1.2 Unit Setup (Excluding Texas)

Unit Param	Units	Val
START UP FLASH	Sec	7
AUTO PED CLR	Enum	disable
RED RV/10	Sec	4.0

### 1.3 Startup

Phase	Units	1	2	3	4	5	6	7	8
[P2] START UP	Enum	phaseNotOn	redClear	phaseNotOn	phaseNotOn	phaseNotOn	redClear	phaseNotOn	phaseNotOn

Phase	Units	9	10	11	12	13	14	15	16
[P2] START UP	Enum	phaseNotOn	phaseNotOn	phaseNotOn	phaseNotOn	phaseNotOn	phaseNotOn	phaseNotOn	phaseNotOn

### 1.4 Channel Setup

Phase	Units	1	2	3	4	5	6	7	8
CS MIN	Phase or Overlap	0	2	0	4	5	6	0	8
CONTROL TYPE	Enum	phaseVehicle	phaseVehicle	phaseVehicle	phaseVehicle	phaseVehicle	phaseVehicle	phaseVehicle	phaseVehicle

Phase	Units	9	10	11	12	13	14	15	16
CS MIN	Phase or Overlap	2	4	6	8	0	0	0	0
CONTROL TYPE	Enum	phasePedestrian	phasePedestrian	phasePedestrian	phasePedestrian	overlap	overlap	overlap	overlap

### 1.6 Logic Gates

Channel Param	Units	1	2	3	4	5	6	7	8
[P2] TYPE*	Enum	3	3	1	1	1	1	1	1
[P2] OUTPUT MODE*	Enum	1	1	1	1	1	1	1	1
[P2] OUTPUT FUNCTION*	Enum	26	4	1	1	1	1	1	1
[P2] OUTPUT FUNCTION INDEX*	Number	1	2	1	1	1	1	1	1
[P2] INPUT 1 INVERT*	Enum	1	0	0	0	0	0	0	0
[P2] INPUT 1 FUNCTION*	Enum	80	80	1	1	1	1	1	1
[P2] INPUT 1 FUNCTION INDEX*	Number	255	20	1	1	1	1	1	1
[P2] INPUT 2 FUNCTION*	Enum	1	80	1	1	1	1	1	1
[P2] INPUT 2 FUNCTION INDEX*	Number	1	21	1	1	1	1	1	1
[P2] INPUT 3 FUNCTION*	Enum	1	80	1	1	1	1	1	1
[P2] INPUT 3 FUNCTION INDEX*	Number	1	22	1	1	1	1	1	1
[P2] INPUT 4 FUNCTION*	Enum	1	1	1	1	1	1	1	1
[P2] INPUT 4 FUNCTION INDEX*	Number	1	1	1	1	1	1	1	1



# Signal Timing Report

## 212: Windermere Road/Adelaide Street N

Channel Param	Units	9	10	11	12	13	14	15	16
[P2] TYPE*	Enum	1	1	1	1	1	1	1	1
[P2] OUTPUT MODE*	Enum	1	1	1	1	1	1	1	1
[P2] OUTPUT FUNCTION*	Enum	1	1	1	1	1	1	1	1
[P2] OUTPUT FUNCTION INDEX*	Number	1	1	1	1	1	1	1	1
[P2] INPUT 1 FUNCTION*	Enum	1	1	1	1	1	1	1	1
[P2] INPUT 1 FUNCTION INDEX*	Number	1	1	1	1	1	1	1	1
[P2] INPUT 2 FUNCTION*	Enum	1	1	1	1	1	1	1	1
[P2] INPUT 2 FUNCTION INDEX*	Number	1	1	1	1	1	1	1	1
[P2] INPUT 3 FUNCTION*	Enum	1	1	1	1	1	1	1	1
[P2] INPUT 3 FUNCTION INDEX*	Number	1	1	1	1	1	1	1	1
[P2] INPUT 4 FUNCTION*	Enum	1	1	1	1	1	1	1	1
[P2] INPUT 4 FUNCTION INDEX*	Number	1	1	1	1	1	1	1	1

Channel Param	Units	17	18	19	20	21	22	23	24
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Channel Param	Units	25	26	27	28	29	30	31	32
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### 2.1.1 Phase Timings Set 1

Phase	Units	1	2	3	4	5	6	7	8
SET 1 - WALK	Sec	0	23	0	7	0	23	0	7
SET 1 - PED CLR	Sec	0	15	0	20	0	15	0	20
SET 1 - MIN GRN	Sec	0	7	0	7	5	7	0	7
SET 1 - PASS/10	Sec	0.0	3.0	0.0	3.0	3.0	3.0	0.0	3.0
SET 1 - MAX 1	Sec	0	38	0	27	8	38	0	27
SET 1 - MAX 2	Sec	0	38	0	27	8	38	0	27
SET 1 - YEL/10	Sec	0.0	3.8	0.0	3.3	3.0	3.8	0.0	3.3
SET 1 - RED/10	Sec	0.0	2.0	0.0	2.8	1.0	2.0	0.0	2.8

Phase	Units	9	10	11	12	13	14	15	16
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### 2.2.1 Phase Options Set 1

Phase	Units	1	2	3	4	5	6	7	8
[P2] SET 1 - OPTIONS*	Bit	Non Lock Det	Non-Actuated 1	Non Lock Det	Non Lock Det	Non Lock Det	Non-Actuated 1	Non Lock Det	Non Lock Det
[P2] SET 1 - OPTIONS 2*	Bit	16	0	16	0	16	0	16	0

Phase	Units	9	10	11	12	13	14	15	16
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[P2] SET 1 - OPTIONS*	Bit	Non Lock Det	Non Lock Det	Non Lock Det	Non Lock Det	Non Lock Det	Non Lock Det	Non Lock Det	Non Lock Det
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# Signal Timing Report

## 212: Windermere Road/Adelaide Street N

### 2.1.2 Phase Timings Set 2

Phase	Units	1	2	3	4	5	6	7	8
SET 2 - WALK	Sec	0	23	0	7	0	23	0	7
SET 2 - PED CLR	Sec	0	15	0	20	0	15	0	20
SET 2 - MIN GRN	Sec	0	7	0	7	5	7	0	7
SET 2 - PASS/10	Sec	0.0	3.0	0.0	3.0	3.0	3.0	0.0	3.0
SET 2 - MAX 1	Sec	0	38	0	27	8	38	0	27
SET 2 - MAX 2	Sec	0	38	0	27	8	38	0	27
SET 2 - YEL/10	Sec	0.0	3.8	0.0	3.3	3.0	3.8	0.0	3.3
SET 2 - RED/10	Sec	0.0	2.0	0.0	2.8	1.0	2.0	0.0	2.8

Phase	Units	9	10	11	12	13	14	15	16
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### 2.2.2 Phase Options Set 2

Phase	Units	1	2	3	4	5	6	7	8
[P2]SET 2 - OPTIONS*	Bit	Non Lock Det	Non-Actuated 1	Non Lock Det	Non Lock Det	Non Lock Det	Non-Actuated 1	Non Lock Det	Non Lock Det
[P2]SET 2 - OPTIONS 2*	Bit	16	0	16	0	16	0	16	0

Phase	Units	9	10	11	12	13	14	15	16
[P2]SET 2 - OPTIONS*	Bit	Non Lock Det	Non Lock Det	Non Lock Det	Non Lock Det	Non Lock Det	Non Lock Det	Non Lock Det	Non Lock Det

### 2.1.3 Phase Timings Set 3

Phase	Units	1	2	3	4	5	6	7	8
SET 3 - WALK	Sec	0	23	0	7	0	23	0	7
SET 3 - PED CLR	Sec	0	15	0	20	0	15	0	20
SET 3 - MIN GRN	Sec	0	7	0	7	5	7	0	7
SET 3 - PASS/10	Sec	0.0	3.0	0.0	3.0	3.0	3.0	0.0	3.0
SET 3 - MAX 1	Sec	0	38	0	27	8	38	0	27
SET 3 - MAX 2	Sec	0	38	0	27	8	38	0	27
SET 3 - YEL/10	Sec	0.0	3.8	0.0	3.3	3.0	3.8	0.0	3.3
SET 3 - RED/10	Sec	0.0	2.0	0.0	2.8	1.0	2.0	0.0	2.8

Phase	Units	9	10	11	12	13	14	15	16
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### 2.2.3 Phase Options Set 3

Phase	Units	1	2	3	4	5	6	7	8
[P2] SET 3 - OPTIONS*	Bit	Non Lock Det	Non-Actuated 1	Non Lock Det	Non Lock Det	Non Lock Det	Non-Actuated 1	Non Lock Det	Non Lock Det
[P2] SET 3 - OPTIONS 2*	Bit	16	0	16	0	16	0	16	0

Phase	Units	9	10	11	12	13	14	15	16
[P2] SET 3 - OPTIONS*	Bit	Non Lock Det	Non Lock Det	Non Lock Det	Non Lock Det	Non Lock Det	Non Lock Det	Non Lock Det	Non Lock Det



# Signal Timing Report

## 212: Windermere Road/Adelaide Street N

### 2.1.4 Phase Timings Set 4

Phase	Units	1	2	3	4	5	6	7	8
SET 4 - WALK	Sec	0	23	0	7	0	23	0	7
SET 4 - PED CLR	Sec	0	15	0	20	0	15	0	20
SET 4 - MIN GRN	Sec	0	7	0	7	5	7	0	7
SET 4 - PASS/10	Sec	0.0	3.0	0.0	3.0	3.0	3.0	0.0	3.0
SET 4 - MAX 1	Sec	0	38	0	27	8	38	0	27
SET 4 - MAX 2	Sec	0	38	0	27	8	38	0	27
SET 4 - YEL/10	Sec	0.0	3.8	0.0	3.3	3.0	3.8	0.0	3.3
SET 4 - RED/10	Sec	0.0	2.0	0.0	2.8	1.0	2.0	0.0	2.8

Phase	Units	9	10	11	12	13	14	15	16
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### 2.2.4 Phase Options Set 4

Phase	Units	1	2	3	4	5	6	7	8
[P2] SET 4 - OPTIONS*	Bit	Non Lock Det	Non-Actuated 1	Non Lock Det	Non Lock Det	Non Lock Det	Non-Actuated 1	Non Lock Det	Non Lock Det
[P2] SET 4 - OPTIONS 2*	Bit	16	0	16	0	16	0	16	0

Phase	Units	9	10	11	12	13	14	15	16
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[P2] SET 4 - OPTIONS*	Bit	Non Lock Det	Non Lock Det	Non Lock Det	Non Lock Det	Non Lock Det	Non Lock Det	Non Lock Det	Non Lock Det
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### 2.3.1 Phase Sequence Set 1

Phase	Units	1	2	3	4	5	6	7	8
[P2] SEQUENCE 1	Phase (,)	(2,4)	(5,6,8)	()	()	()	()	()	()

Phase	Units	9	10	11	12	13	14	15	16
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### 2.3.2 Phase Sequence Set 2

Phase	Units	1	2	3	4	5	6	7	8
[P2] SEQUENCE 2	Phase (,)	(2,4)	(5,6,8)	()	()	()	()	()	()

Phase	Units	9	10	11	12	13	14	15	16
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### 2.4 Phase Enable and Rings

Phase	Units	1	2	3	4	5	6	7	8
[P2] RING	Ring	0	1	0	1	2	2	0	2

Phase	Units	9	10	11	12	13	14	15	16
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### 2.5 Phase Concurrency

Phase	Units	1	2	3	4	5	6	7	8
[P2] PHASE CONCURRENCY	Phase (,)	()	(5,6)	()	(8)	(2)	(2)	()	(4)

Overlap	Units	9	10	11	12	13	14	15	16
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### 3.1.1 Vehicle Overlap Set

Overlap	Units	1	2	3	4	5	6	7	8
[P2] TYPE	Enum	normal	normal	normal	normal	normal	normal	normal	normal



# Signal Timing Report

## 212: Windermere Road/Adelaide Street N

Overlap	Units	9	10	11	12	13	14	15	16
[P2] TYPE	Enum	normal	normal	normal	normal	normal	normal	normal	normal

### 4.1.1 Vehicle Detector Set 1

Veh Detector	Units	1	2	3	4	5	6	7	8
OPTIONS	Bit	Passage	Passage	Passage	Passage	Passage	Passage	Passage	Passage
NO ACT	Min	0	0	0	0	60	0	0	0
MAX PR	Min	0	0	0	60	60	0	0	60

Veh Detector	Units	9	10	11	12	13	14	15	16
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Veh Detector	Units	17	18	19	20	21	22	23	24
OPTIONS	Bit	0	0	0	0	0	0	0	Volume
NO ACT	Min	0	0	0	0	0	0	0	60
MAX PR	Min	0	0	0	0	0	0	0	60
ER CNTS	Counts/Min	0	0	0	0	0	0	0	255

Veh Detector	Units	25	26	27	28	29	30	31	32
OPTIONS	Bit	0	Volume	0	0	0	0	0	0
NO ACT	Min	0	60	0	0	0	0	0	0
MAX PR	Min	0	60	0	0	0	0	0	0
ER CNTS	Counts/Min	0	255	0	0	0	0	0	0

Veh Detector	Units	33	34	35	36	37	38	39	40
OPTIONS	Bit	Volume	0	0	0	0	Volume	0	Volume
NO ACT	Min	0	0	0	0	0	60	0	60
MAX PR	Min	60	0	0	0	0	60	0	60
ER CNTS	Counts/Min	255	0	0	0	0	255	0	255

Veh Detector	Units	41	42	43	44	45	46	47	48
OPTIONS	Bit	0	0	0	0	0	0	Volume	0
MAX PR	Min	0	0	0	0	0	0	60	0
ER CNTS	Counts/Min	0	0	0	0	0	0	255	0

Veh Detector	Units	49	50	51	52	53	54	55	56
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Veh Detector	Units	57	58	59	60	61	62	63	64
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Veh Detector	Units	65	66	67	68	69	70	71	72
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Veh Detector	Units	73	74	75	76	77	78	79	80
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Veh Detector	Units	81	81	83	84	85	86	87	88
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Veh Detector	Units	89	90	91	92	93	94	95	96
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Veh Detector	Units	97	98	99	100	101	102	103	104
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Veh Detector	Units	105	106	107	108	109	110	111	112
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# Signal Timing Report

## 212: Windermere Road/Adelaide Street N

Veh Detector	Units	113	114	115	116	117	118	119	120
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Veh Detector	Units	121	122	123	124	125	126	127	128
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### 4.2.1 Pedestrian Detector Set 1

Ped Detector	Units	1	2	3	4	5	6	7	8
--------------	-------	---	---	---	---	---	---	---	---

MAX PR	Min	0	0	0	60	0	0	0	60
--------	-----	---	---	---	----	---	---	---	----

Ped Detector	Units	9	10	11	12	13	14	15	16
--------------	-------	---	----	----	----	----	----	----	----

### 4.2.1 Pedestrian Detector Set 2

Ped Detector	Units	1	2	3	4	5	6	7	8
--------------	-------	---	---	---	---	---	---	---	---

MAX PR	Min	0	0	0	60	0	0	0	60
--------	-----	---	---	---	----	---	---	---	----

Ped Detector	Units	9	10	11	12	13	14	15	16
--------------	-------	---	----	----	----	----	----	----	----

### 4.3.1 Vehicle Detector Diagnostics Set 1

Veh Detector	Units	1	2	3	4	5	6	7	8
--------------	-------	---	---	---	---	---	---	---	---

OPTIONS	Bit	Passage	Passage	Passage	Passage	Passage	Passage	Passage	Passage
---------	-----	---------	---------	---------	---------	---------	---------	---------	---------

NO ACT	Min	0	0	0	0	60	0	0	0
--------	-----	---	---	---	---	----	---	---	---

MAX PR	Min	0	0	0	60	60	0	0	60
--------	-----	---	---	---	----	----	---	---	----

### 4.3.2 Vehicle Detector Diagnostics Set 2

Veh Detector	Units	9	10	11	12	13	14	15	16
--------------	-------	---	----	----	----	----	----	----	----

### 4.4.1 Pedestrian Detector Diagnostics Set 1

Ped Detector	Units	1	2	3	4	5	6	7	8
--------------	-------	---	---	---	---	---	---	---	---

MAX PR	Min	0	0	0	60	0	0	0	60
--------	-----	---	---	---	----	---	---	---	----

Ped Detector	Units	9	10	11	12	13	14	15	16
--------------	-------	---	----	----	----	----	----	----	----

### 5.1 Coordination Constants

Coord Param	Units	Val
-------------	-------	-----

CORRECTION MODE Enum shortway

MAXIMUM MODE Enum maxInhibit

COORD FORCE MODE Enum fixed



# Signal Timing Report

## 212: Windermere Road/Adelaide Street N

### 5.2 Patterns

Coord Pattern	Units	1	2	3	4	5	6	7	8
CYCLE TIME	Sec	130	0	SAT 110	0	PM 110	0	0	0
OFFSET TIME	Sec	26	0	57	0	37	0	0	0
SPLIT	Split	1	2	3	4	5	6	7	8
SEQUENCE	Sequence	1	1	1	1	1	1	1	1
CORRECTION MODE*	Enum	1	1	1	1	1	1	1	1
MAXIMUM MODE*	Enum	1	1	1	1	1	1	1	1
COORD FORCE MODE *	Enum	1	1	1	1	1	1	1	1
PERMIT STRATEGY*	Enum	1	1	1	1	1	1	1	1
OMIT STRATEGY*	Enum	1	1	1	1	1	1	1	1
NO EARLY RETURN*	Enum	1	1	1	1	1	1	1	1
TIMING SET*	Number	2	1	3	1	4	1	1	1
PHASE OPTION SET*	Number	2	1	3	1	4	1	1	1

Coord Pattern	Units	9	10	11	12	13	14	15	16
SPLIT	Split	9	10	11	12	13	14	15	16
SEQUENCE	Sequence	1	1	1	1	1	1	1	1
CORRECTION MODE*	Enum	1	1	1	1	1	1	1	1
MAXIMUM MODE*	Enum	1	1	1	1	1	1	1	1
COORD FORCE MODE *	Enum	1	1	1	1	1	1	1	1
PERMIT STRATEGY*	Enum	1	1	1	1	1	1	1	1
OMIT STRATEGY*	Enum	1	1	1	1	1	1	1	1
NO EARLY RETURN*	Enum	1	1	1	1	1	1	1	1
TIMING SET*	Number	1	1	1	1	1	1	1	1
PHASE OPTION SET*	Number	1	2	2	1	1	1	1	1

Coord Pattern	Units	17	18	19	20	21	22	23	24
SPLIT	Split	17	18	19	20	21	22	1	1
SEQUENCE	Sequence	1	1	1	1	1	1	1	1
CORRECTION MODE*	Enum	1	1	1	1	1	1	1	1
MAXIMUM MODE*	Enum	1	1	1	1	1	1	1	1
COORD FORCE MODE *	Enum	1	1	1	1	1	1	1	1
PERMIT STRATEGY*	Enum	1	1	1	1	1	1	1	1
OMIT STRATEGY*	Enum	1	1	1	1	1	1	1	1
NO EARLY RETURN*	Enum	1	1	1	1	1	1	1	1
TIMING SET*	Number	1	1	1	1	1	1	1	1
PHASE OPTION SET*	Number	1	1	1	1	1	1	1	1
DETECTOR RESET*	Enum	0	0	0	0	0	1	0	0
MAX 2 PHASES*	Bit	0	0	0	0	170	170	0	0



# Signal Timing Report

## 212: Windermere Road/Adelaide Street N

Page 8 of 12  
RunTime:2023-03-12 19:00:43

Coord Pattern	Units	25	26	27	28	29	30	31	32
SPLIT	Split	1	1	1	1	1	1	1	1
SEQUENCE	Sequence	1	1	1	1	1	1	1	1
CORRECTION MODE*	Enum	1	1	1	1	1	1	1	1
MAXIMUM MODE*	Enum	1	1	1	1	1	1	1	1
COORD FORCE MODE *	Enum	1	1	1	1	1	1	1	1
PERMIT STRATEGY*	Enum	1	1	1	1	1	1	1	1
OMIT STRATEGY*	Enum	1	1	1	1	1	1	1	1
NO EARLY RETURN*	Enum	1	1	1	1	1	1	1	1
TIMING SET*	Number	1	1	1	1	1	1	1	1
PHASE OPTION SET*	Number	1	1	1	1	1	1	1	1



# Signal Timing Report

## 212: Windermere Road/Adelaide Street N

### 5.3 Coordination Split

Coord Split	Units	1	2	3	4	5	6	7	8
SPLIT 1 - MODE	Enum	none	8	none	none	none	8	none	none
SPLIT 1 - TIME	Sec	0	96	0	34	26	70	0	34
SPLIT 1 - COORD	Enum	false	true	false	false	false	true	false	false
SPLIT 2 - MODE	Enum	none	8	none	none	none	none	none	none
SPLIT 3 - MODE	Enum	none	8	none	none	none	8	none	none
SPLIT 3 - TIME	Sec	0	72	0	38	18	54	0	38
SPLIT 3 - COORD	Enum	false	true	false	false	false	true	false	false
SPLIT 4 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 5 - MODE	Enum	none	8	none	none	none	8	none	none
SPLIT 5 - TIME	Sec	0	74	0	36	30	44	0	36
SPLIT 5 - COORD	Enum	false	true	false	false	false	true	false	false
SPLIT 6 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 7 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 8 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 9 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 10 - MODE	Enum	none	8	none	none	none	8	none	none
SPLIT 11 - MODE	Enum	none	8	none	none	none	8	none	none
SPLIT 12 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 13 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 14 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 15 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 16 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 17 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 18 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 19 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 20 - MODE	Enum	none	maxVehAndPedR	none	none	none	maxVehAndPedR	none	none
SPLIT 21 - MODE	Enum	none	maxVehAndPedR	none	none	phaseOmitted	maxVehAndPedR	none	none
SPLIT 22 - MODE	Enum	none	maxVehAndPedR	none	none	none	maxVehAndPedR	none	none
SPLIT 23 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 24 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 25 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 26 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 27 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 28 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 29 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 30 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 31 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 32 - MODE	Enum	none	none	none	none	none	none	none	none





# Signal Timing Report

## 212: Windermere Road/Adelaide Street N

Coord Split	Units	9	10	11	12	13	14	15	16
SPLIT 1 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 2 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 3 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 4 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 5 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 6 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 7 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 8 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 9 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 10 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 11 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 12 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 13 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 14 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 15 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 16 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 17 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 18 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 19 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 20 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 21 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 22 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 23 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 24 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 25 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 26 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 27 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 28 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 29 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 30 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 31 - MODE	Enum	none	none	none	none	none	none	none	none
SPLIT 32 - MODE	Enum	none	none	none	none	none	none	none	none

### 6.3.2 Daylight Saving Time – Schedule

TB DST	Units	Val
BEGIN MONTH	Enum	absolute
BEGIN OCCURRENCE	Enum	first
BEGIN DOW	Enum	sunday
BEGIN DOM	Date	13
BEGIN SECONDS	Sec	9943200
END MONTH	Enum	1
END OCCURRENCE	Enum	1
END DOW	Enum	1



# Signal Timing Report

## 212: Windermere Road/Adelaide Street N

TB DST	Units	Val
END DOM	Date	1
END SECONDS	Sec	25668000
ADJUSTMENT	Sec	3600

### 6.5.1 TB Dayplan

TB Dayplan	Units	1	2	3	4	5	6	7	8
PLAN 1 HOUR	Hour	0	9	20	0	0	0	0	0
PLAN 1 MINUTE	Min	1	0	0	0	0	0	0	0
PLAN 1 ACTION	Number	21	3	21	0	0	0	0	0
PLAN 2 HOUR	Hour	0	6	9	15	18	22	0	0
PLAN 2 MINUTE	Min	1	30	30	30	30	0	0	0
PLAN 2 ACTION	Number	21	1	3	5	3	21	0	0
PLAN 7 HOUR	Hour	0	7	22	0	0	0	0	0
PLAN 7 MINUTE	Min	1	0	0	0	0	0	0	0
PLAN 7 ACTION	Number	21	3	21	0	0	0	0	0

TB Dayplan	Units	9	10	11	12	13	14	15	16
------------	-------	---	----	----	----	----	----	----	----

TB Dayplan	Units	17	18	19	20	21	22	23	24
------------	-------	----	----	----	----	----	----	----	----

TB Dayplan	Units	25	26	27	28	29	30	31	32
------------	-------	----	----	----	----	----	----	----	----

### 6.6.1 Action Parameters

TB Action	Units	1	2	3	4	5	6	7	8
PATTERN	Enum	Pattern 1	Pattern 2	Pattern 3	Pattern 4	Pattern 5	Pattern 6	Pattern 7	Pattern 8

TB Action	Units	9	10	11	12	13	14	15	16
PATTERN	Enum	Pattern 9	Pattern 10	Pattern 11	Pattern 12	Pattern 13	Pattern 14	Pattern 15	Pattern 16

TB Action	Units	17	18	19	20	21	22	23	24
PATTERN	Enum	Pattern 17	Pattern 18	Pattern 19	Pattern 20	Pattern 21	Pattern 22	Interconnect	Interconnect

TB Action	Units	25	26	27	28	29	30	31	32
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# Signal Timing Report

## 212: Windermere Road/Adelaide Street N

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RunTime:2023-03-12 19:00:46

### 7.1 - 7.3 Preempt

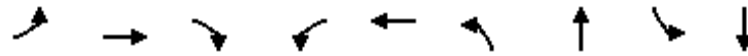
Preempt Param	Units	1	2	3	4	5	6	7	8
CONTROL	Bit	Non-Locking	0	Non-Locking	Non-Locking	0	0		
MIN GRN	Sec	255	255	255	255	255	255		
MIN WALK	Sec	0	0	255	255	255	255		
ENTER PED CLR	Sec	255	255	255	255	255	255		
MIN DWELL	Sec	20	20	0	0	0	0		
MAX PR	Sec	120	120	0	0	0	0		
[P2] DWELL PHASE	Phase (.)	(2,6)	(4,8)	()	()	()	()	()	()
[P2] EXIT PHASES	Phase (.)	(4,8)	(2,6)	()	()	()	()	()	()
ENTER YELLOW CHANGE	Sec	25.5	25.5	25.5	25.5	25.5	25.5		
ENTER RED CLEAR	Sec	25.5	25.5	25.5	25.5	25.5	25.5		
TRACK YELLOW CHANGE	Sec	0.0	0.0	25.5	25.5	25.5	25.5		
TRACK RED CLEAR	Sec	0.0	0.0	25.5	25.5	25.5	25.5		

## **Appendix B – Synchro Output Reports - Existing Traffic**

Timings

Existing PM

1: Adelaide St N & Windermere Rd

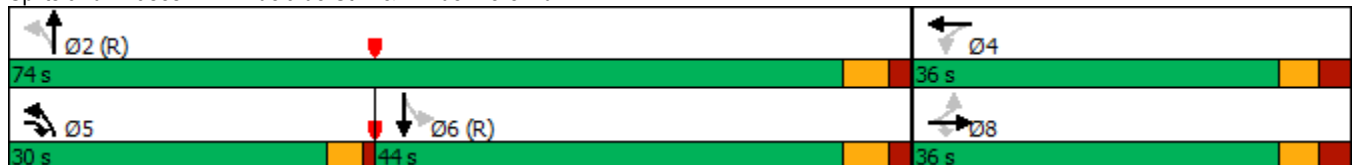


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↗	↖	↕	↖	↕
Traffic Volume (vph)	307	41	459	25	21	336	859	60	778
Future Volume (vph)	307	41	459	25	21	336	859	60	778
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+pt	NA	Perm	NA
Protected Phases		8	5		4	5	2		6
Permitted Phases	8		8	4		2		6	
Detector Phase	8	8	8	4	4	5	2	6	6
Switch Phase									
Minimum Initial (s)	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0	7.0
Minimum Split (s)	33.1	33.1	22.0	33.1	33.1	22.0	43.8	43.8	43.8
Total Split (s)	36.0	36.0	30.0	36.0	36.0	30.0	74.0	44.0	44.0
Total Split (%)	32.7%	32.7%	27.3%	32.7%	32.7%	27.3%	67.3%	40.0%	40.0%
Yellow Time (s)	3.3	3.3	3.0	3.3	3.3	3.0	3.8	3.8	3.8
All-Red Time (s)	2.8	2.8	1.0	2.8	2.8	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	4.0	6.1	6.1	4.0	5.8	5.8	5.8
Lead/Lag			Lead			Lead		Lag	Lag
Lead-Lag Optimize?			Yes			Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max
Act Effct Green (s)	28.5	28.5	51.0	28.5	28.5	71.4	69.6	45.2	45.2
Actuated g/C Ratio	0.26	0.26	0.46	0.26	0.26	0.65	0.63	0.41	0.41
v/c Ratio	0.92	0.09	0.64	0.07	0.10	0.87	0.43	0.27	0.86
Control Delay	70.6	30.5	21.2	30.6	17.4	50.4	11.0	29.0	36.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.6	30.5	21.2	30.6	17.4	50.4	11.0	29.0	36.1
LOS	E	C	C	C	B	D	B	C	D
Approach Delay		40.4			22.0		21.5		35.8
Approach LOS		D			C		C		D

Intersection Summary

Cycle Length: 110  
 Actuated Cycle Length: 110  
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.92  
 Intersection Signal Delay: 31.3  
 Intersection Capacity Utilization 90.3%  
 Analysis Period (min) 15  
 Intersection LOS: C  
 ICU Level of Service E

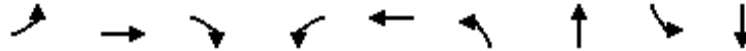
Splits and Phases: 1: Adelaide St N & Windermere Rd



## Queues

Existing PM

## 1: Adelaide St N &amp; Windermere Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	323	43	483	26	49	354	972	63	1246
v/c Ratio	0.92	0.09	0.64	0.07	0.10	0.87	0.43	0.27	0.86
Control Delay	70.6	30.5	21.2	30.6	17.4	50.4	11.0	29.0	36.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.6	30.5	21.2	30.6	17.4	50.4	11.0	29.0	36.1
Queue Length 50th (m)	66.3	6.9	61.0	4.2	3.5	57.2	52.2	9.2	123.0
Queue Length 95th (m)	#115.4	15.6	82.4	11.0	12.6	87.7	65.6	22.1	#182.0
Internal Link Dist (m)		267.6			300.4		227.3		193.7
Turn Bay Length (m)	60.0		60.0	30.0		70.0		30.0	
Base Capacity (vph)	370	522	768	373	492	490	2265	232	1450
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.08	0.63	0.07	0.10	0.72	0.43	0.27	0.86

## Intersection Summary
























# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

# HCM Signalized Intersection Capacity Analysis

## 1: Adelaide St N & Windermere Rd

Existing PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	307	41	459	25	21	26	336	859	65	60	778	406
Future Volume (vph)	307	41	459	25	21	26	336	859	65	60	778	406
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1	4.0	6.1	6.1		4.0	5.8		5.8	5.8	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	0.99	1.00	1.00	0.98	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.92		1.00	0.99		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1786	1921	1586	1789	1739		1807	3573		1824	3393	
Flt Permitted	0.73	1.00	1.00	0.73	1.00		0.08	1.00		0.29	1.00	
Satd. Flow (perm)	1363	1921	1586	1373	1739		154	3573		566	3393	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	323	43	483	26	22	27	354	904	68	63	819	427
RTOR Reduction (vph)	0	0	24	0	20	0	0	5	0	0	55	0
Lane Group Flow (vph)	323	43	459	26	29	0	354	967	0	63	1191	0
Confl. Peds. (#/hr)	10		17	17		10	7		2	2		7
Heavy Vehicles (%)	1%	0%	1%	0%	0%	0%	1%	1%	0%	0%	1%	1%
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8	5		4		5	2			6	
Permitted Phases	8		8	4			2			6		
Actuated Green, G (s)	28.5	28.5	48.8	28.5	28.5		69.6	69.6		45.3	45.3	
Effective Green, g (s)	28.5	28.5	48.8	28.5	28.5		69.6	69.6		45.3	45.3	
Actuated g/C Ratio	0.26	0.26	0.44	0.26	0.26		0.63	0.63		0.41	0.41	
Clearance Time (s)	6.1	6.1	4.0	6.1	6.1		4.0	5.8		5.8	5.8	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	353	497	703	355	450		402	2260		233	1397	
v/s Ratio Prot		0.02	0.12		0.02		c0.16	0.27			0.35	
v/s Ratio Perm	c0.24		0.17	0.02			c0.39			0.11		
v/c Ratio	0.92	0.09	0.65	0.07	0.06		0.88	0.43		0.27	0.85	
Uniform Delay, d1	39.6	30.9	24.0	30.8	30.7		32.5	10.2		21.4	29.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	27.4	0.1	2.2	0.1	0.1		19.6	0.6		2.8	6.8	
Delay (s)	67.0	31.0	26.2	30.9	30.8		52.0	10.8		24.3	36.1	
Level of Service	E	C	C	C	C		D	B		C	D	
Approach Delay (s)		41.9			30.8			21.8			35.5	
Approach LOS		D			C			C			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			31.8				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			110.0				Sum of lost time (s)			15.9		
Intersection Capacity Utilization			90.3%				ICU Level of Service			E		
Analysis Period (min)			15									

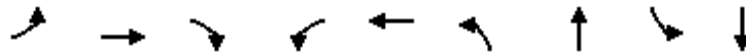
c Critical Lane Group



Timings

Existing SAT

1: Adelaide St N & Windermere Rd



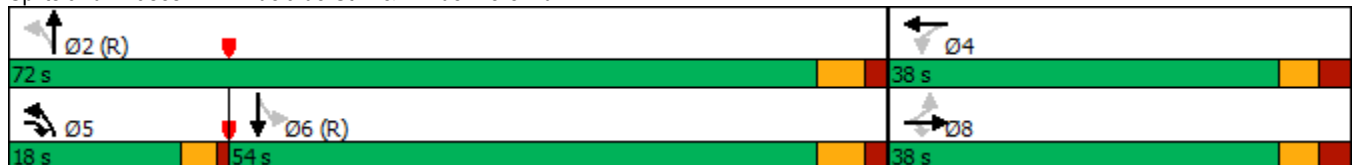
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↗	↖	↕	↖	↕
Traffic Volume (vph)	143	16	260	19	14	274	730	28	719
Future Volume (vph)	143	16	260	19	14	274	730	28	719
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+pt	NA	Perm	NA
Protected Phases		8	5		4	5	2		6
Permitted Phases	8		8	4		2		6	
Detector Phase	8	8	8	4	4	5	2	6	6
Switch Phase									
Minimum Initial (s)	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0	7.0
Minimum Split (s)	33.1	33.1	9.0	33.1	33.1	9.0	43.8	43.8	43.8
Total Split (s)	38.0	38.0	18.0	38.0	38.0	18.0	72.0	54.0	54.0
Total Split (%)	34.5%	34.5%	16.4%	34.5%	34.5%	16.4%	65.5%	49.1%	49.1%
Yellow Time (s)	3.3	3.3	3.0	3.3	3.3	3.0	3.8	3.8	3.8
All-Red Time (s)	2.8	2.8	1.0	2.8	2.8	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	4.0	6.1	6.1	4.0	5.8	5.8	5.8
Lead/Lag			Lead			Lead		Lag	Lag
Lead-Lag Optimize?			Yes			Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max
Act Effct Green (s)	17.5	17.5	31.4	17.5	17.5	82.4	80.6	64.8	64.8
Actuated g/C Ratio	0.16	0.16	0.29	0.16	0.16	0.75	0.73	0.59	0.59
v/c Ratio	0.69	0.06	0.52	0.09	0.14	0.59	0.30	0.07	0.45
Control Delay	58.7	36.4	20.2	37.2	19.8	10.0	5.9	13.9	14.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.7	36.4	20.2	37.2	19.8	10.0	5.9	13.9	14.5
LOS	E	D	C	D	B	B	A	B	B
Approach Delay		34.0			25.5		7.0		14.5
Approach LOS		C			C		A		B

Intersection Summary

Cycle Length: 110  
 Actuated Cycle Length: 110  
 Offset: 57 (52%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.69  
 Intersection Signal Delay: 15.0  
 Intersection Capacity Utilization 75.7%  
 Analysis Period (min) 15

Intersection LOS: B  
 ICU Level of Service D

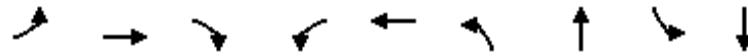
Splits and Phases: 1: Adelaide St N & Windermere Rd



## Queues

Existing SAT

## 1: Adelaide St N &amp; Windermere Rd


























Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	151	17	274	20	41	288	792	29	924
v/c Ratio	0.69	0.06	0.52	0.09	0.14	0.59	0.30	0.07	0.45
Control Delay	58.7	36.4	20.2	37.2	19.8	10.0	5.9	13.9	14.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.7	36.4	20.2	37.2	19.8	10.0	5.9	13.9	14.5
Queue Length 50th (m)	31.0	3.1	29.0	3.7	2.8	15.5	26.0	2.4	51.1
Queue Length 95th (m)	48.3	8.6	41.2	9.7	11.2	32.1	44.4	9.1	91.3
Internal Link Dist (m)		267.6			300.4		227.3		193.7
Turn Bay Length (m)	60.0		60.0	30.0		70.0		30.0	
Base Capacity (vph)	402	530	622	413	518	526	2635	397	2070
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.03	0.44	0.05	0.08	0.55	0.30	0.07	0.45

## Intersection Summary

HCM Signalized Intersection Capacity Analysis  
1: Adelaide St N & Windermere Rd

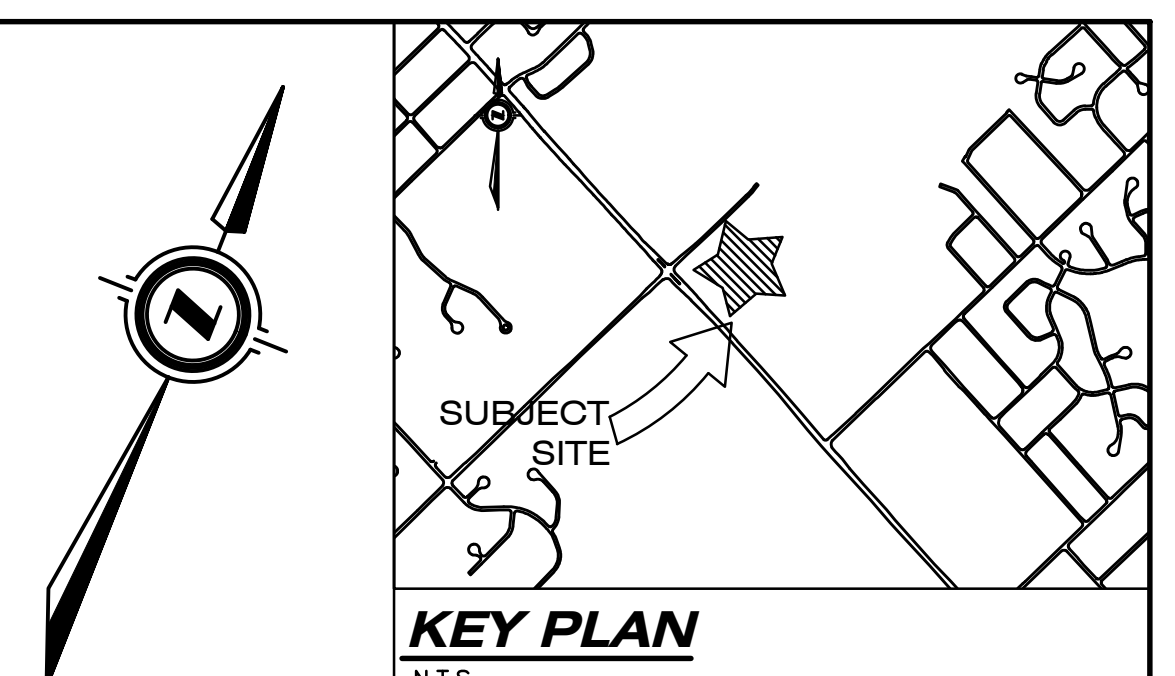
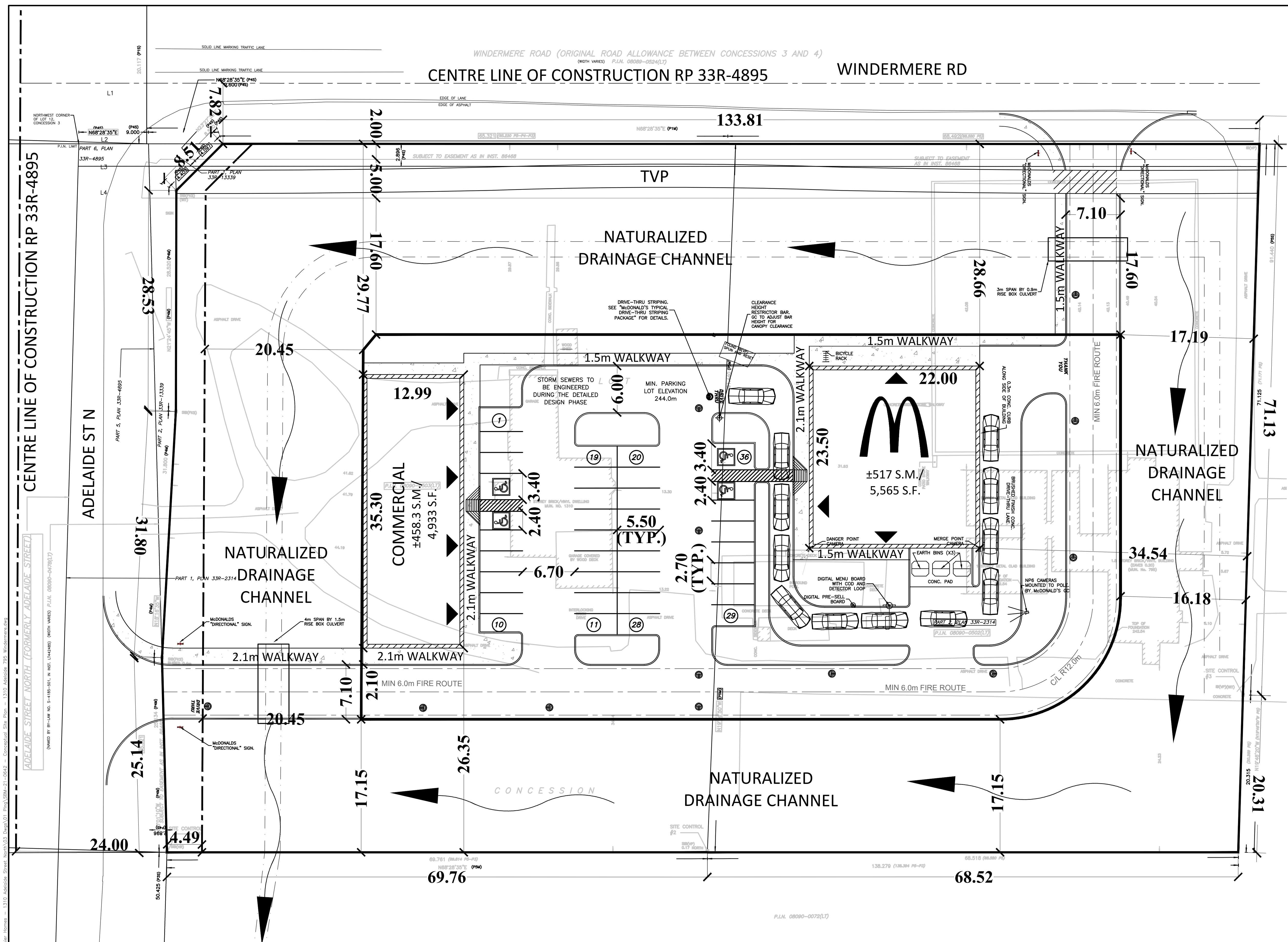
Existing SAT

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	143	16	260	19	14	25	274	730	23	28	719	159
Future Volume (vph)	143	16	260	19	14	25	274	730	23	28	719	159
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1	4.0	6.1	6.1		4.0	5.8		5.8	5.8	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.90		1.00	1.00		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1830	1601	1816	1724		1805	3596		1820	3492	
Flt Permitted	0.73	1.00	1.00	0.75	1.00		0.24	1.00		0.35	1.00	
Satd. Flow (perm)	1388	1830	1601	1427	1724		460	3596		675	3492	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	151	17	274	20	15	26	288	768	24	29	757	167
RTOR Reduction (vph)	0	0	75	0	22	0	0	1	0	0	12	0
Lane Group Flow (vph)	151	17	199	20	19	0	288	791	0	29	912	0
Confl. Peds. (#/hr)	1		4	4		1	13		6	6		13
Heavy Vehicles (%)	1%	5%	1%	0%	0%	0%	1%	1%	0%	0%	1%	1%
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8	5		4		5	2			6	6
Permitted Phases	8		8	4			2			6		
Actuated Green, G (s)	17.5	17.5	29.3	17.5	17.5		80.6	80.6		64.8	64.8	
Effective Green, g (s)	17.5	17.5	29.3	17.5	17.5		80.6	80.6		64.8	64.8	
Actuated g/C Ratio	0.16	0.16	0.27	0.16	0.16		0.73	0.73		0.59	0.59	
Clearance Time (s)	6.1	6.1	4.0	6.1	6.1		4.0	5.8		5.8	5.8	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	220	291	426	227	274		481	2634		397	2057	
v/s Ratio Prot		0.01	0.05		0.01		c0.06	0.22			0.26	
v/s Ratio Perm	c0.11		0.07	0.01			c0.37			0.04		
v/c Ratio	0.69	0.06	0.47	0.09	0.07		0.60	0.30		0.07	0.44	
Uniform Delay, d1	43.7	39.3	33.8	39.4	39.3		6.7	5.0		9.7	12.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.6	0.1	0.8	0.2	0.1		2.0	0.3		0.4	0.7	
Delay (s)	52.2	39.3	34.6	39.6	39.4		8.7	5.3		10.1	13.3	
Level of Service	D	D	C	D	D		A	A		B	B	
Approach Delay (s)		40.8			39.5			6.2			13.2	
Approach LOS		D			D			A			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			15.7				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			110.0				Sum of lost time (s)			15.9		
Intersection Capacity Utilization			75.7%				ICU Level of Service			D		
Analysis Period (min)			15									

c Critical Lane Group

## **Appendix C – Conceptual Site Plan**





**LEGAL INFORMATION**

PART OF  
 CON 3 PT LOT 12 RP 33R2314 PT PART 1 REG &  
 CON 3 PT LOT 12 RP 33R2314 PART 2  
 IN THE  
 CITY OF LONDON  
 COUNTY OF MIDDLESEX

**AREAS**

TOTAL SITE AREA:	1310 ADELAIDE ST N = 6,445.9m <sup>2</sup>	795 WINDERMERE RD = 6,261.9m <sup>2</sup>
GROSS SITE AREA:	12,707.8m <sup>2</sup>	
ROW WIDENING:	395.5m <sup>2</sup>	
NET SITE AREA:	12,312.3m <sup>2</sup>	
TVP:	933.4m <sup>2</sup>	
CHANNEL AREA:	6,571.3m <sup>2</sup>	
DEVELOPABLE AREA:	4,807.5m <sup>2</sup>	
REQUIRED 2% PARKLAND DEDICATION:	GROSS SITE = 254.2m <sup>2</sup>	NET SITE = 246.2m <sup>2</sup>
DEVELOPABLE AREA = 96.2m <sup>2</sup>		
PROPOSED PARKLAND DEDICATION:	TVP = 933.4m <sup>2</sup>	GROSS SITE AREA = 7.3%
	NET SITE AREA = 7.6%	DEVELOPABLE AREA = 19.4%

**ZONING DATA CHART**

GROSS SITE AREA:	12,707.8 m <sup>2</sup>	ASPHALT AREA:	2,970.1 m <sup>2</sup>	GROSS DEVELOPABLE AREA:	4,807.5 m <sup>2</sup>	LANDSCAPED AREA:	7,477.2 m <sup>2</sup>	GROSS BUILDING AREA:	975.3 m <sup>2</sup>	NET DEVELOPABLE AREA:	1,164.7 m <sup>2</sup>
NET SITE AREA:	12,312.3 m <sup>2</sup>	ASPHALT AREA:	2,882.4 m <sup>2</sup>	NET DEVELOPABLE AREA:	4,807.5 m <sup>2</sup>	LANDSCAPED AREA:	7,477.2 m <sup>2</sup>	GROSS BUILDING AREA:	975.3 m <sup>2</sup>	NET DEVELOPABLE AREA:	1,164.7 m <sup>2</sup>

ITEM	NSA**	REQUIRED	PROVIDED
1	LOT AREA (m <sup>2</sup> MIN)	N/A	12,312.3 NET SITE
2	LOT FRONTAGE (m MIN)	40.0	85.4 ADELAIDE ST N
3	LOT DEPTH (m MIN)	40.0	133.8 WINDERMERE RD
4	FRONT YARD AND EXTERIOR SIDE YARD SETBACK (m MIN)	ADELAIDE ST N: 0.0 WINDERMERE RD: 0.0	ADELAIDE ST N: 20.45 WINDERMERE RD: 28.66
5	REAR YARD AND INTERIOR SIDE YARD SETBACK (m MIN)	3.0	ABUTTING OPEN SPACE: 34.5 ABUTTING OPEN SPACE: 26.3
6	LANDSCAPED OPEN SPACE (% MINIMUM)	15	60.7 NET SITE 68.6 GROSS SITE 24.2 DEV. SITE
7	LOT COVERAGE (% MAX)	30	7.9 NET SITE 7.7 GROSS SITE 20.3 DEV. SITE
8	HEIGHT MAXIMUM (m)	12	<12
9	GROSS FLOOR AREA (m <sup>2</sup> MAX)	6,000	975.3

**PARKING REQUIREMENTS**

MINIMUM PARKING SPACE DIMENSIONS 2.7mX5.5m, TYPE A 3.4mX5.5m, TYPE B 2.4mX5.5m

REQUIRED PARKING FAST FOOD	1/20m <sup>2</sup> 517.0m <sup>2</sup>	= 26 SPACES
STACKED DRIVE-THRU		= 12 SPACES
COMMERCIAL RETAIL	1/50m <sup>2</sup> 458.3m <sup>2</sup>	= 10 SPACES
TOTAL REQUIRED PARKING		= 48 SPACES
TOTAL PROVIDED PARKING		= 48 SPACES
B/F PARKING REQUIRED: 4% OF TOTAL PARKING REQUIRED		= 2 SPACES
B/F PROVIDED		2 TYPE 'A', 2 TYPE 'B'
BICYCLE PARKING: 3+(0.3/100m <sup>2</sup> ) OF GFA 975.3m <sup>2</sup> = 3		= 6 SPACES
BICYCLE PARKING PROVIDED:		= 6 SPACES

DISCLAIMER:  
 1. THIS IS A COMPILED PLAN AND SHOULD NOT BE CONSIDERED A PLAN OF SURVEY.  
 2. CONCEPT PLAN IS PRELIMINARY AND HAS NOT BEEN REVIEWED BY THE CITY.

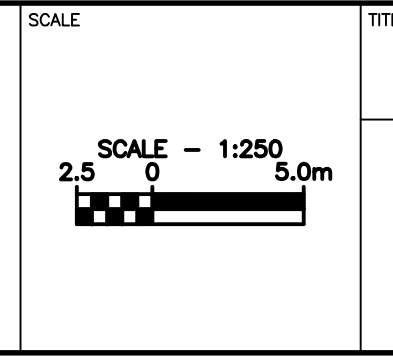
CONCEPTUAL DESIGN  
 FOR DISCUSSION  
 PURPOSES ONLY

AS CONSTRUCTED SERVICES	COMPLETION	No.	REVISIONS	D/M/Y	BY	CONSULTANT
DESIGN	JR	1	INITIAL DESIGN	16/07/21	JR	
DRAWN	JR	2	UPDATED LAYOUT INCLUDING CHANNELS	16/08/21	JR	
CHECKED	LK	3	UPDATED BASED ON CoFL & NEW CHANNELS	16/09/21	JR	
APPROVED	LK	4	REVISED LAYOUT WITH INTERNAL CHANNELS	11/03/21	JR	
DATE		5	UPDATED PARKING AND BUILDING AREAS	01/04/22	JR	
		6	UPDATED PER RECENT MUNICIPAL MEETING	26/08/22	JR	
CAD		7	FOR CITY SUBMISSION	12/10/22	JR	

**STRIK BALDINELLI MONIZ**  
 sbm  
 PLANNING - CIVIL - STRUCTURAL - MECHANICAL - ELECTRICAL  
 1599 Adelaide St. N, Unit 301, London, Ontario, N5X 4E8  
 Tel: (519) 471-6667 Fax: (519) 471-0034  
 Email: sbm@sbmltd.ca

ENGINEER'S STAMP  
**PRELIMINARY  
 NOT FOR  
 CONSTRUCTION**

CLIENT  
**2796539 ONTARIO INC.  
 ROYAL PREMIER  
 DEVELOPMENT**  
 425-509 COMMISSIONERS ROAD W  
 LONDON, ON  
 N6J 1Y5



TITLE  
**PRELIMINARY SITE PLAN & ZONING CHART**  
**CONCEPTUAL SITE PLAN**  
 1310 ADELAIDE ST N & 795 WINDERMERE RD  
 LONDON, ON.

PROJECT No.  
**SBM-21-0642**

SHEET No.  
**SP1**

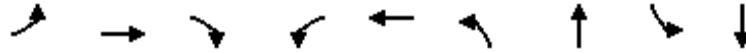
PLAN FILE No.

## **Appendix D – Synchro Output Reports - 2029 Background Traffic**





## 1: Adelaide St N &amp; Windermere Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	364	49	544	31	57	399	1097	72	1405
v/c Ratio	0.99	0.09	0.70	0.08	0.12	1.00	0.49	0.36	0.99
Control Delay	85.3	30.7	24.3	30.8	16.9	76.8	12.2	29.5	51.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.3	30.7	24.3	30.8	16.9	76.8	12.2	29.5	51.5
Queue Length 50th (m)	77.9	7.9	74.9	5.0	4.0	69.4	62.2	10.6	146.4
Queue Length 95th (m)	#137.0	17.2	111.6	12.4	13.7	#131.2	77.2	23.9	#198.0
Internal Link Dist (m)		267.6			300.4		227.3		193.7
Turn Bay Length (m)	60.0		60.0	30.0		70.0		30.0	
Base Capacity (vph)	368	522	774	371	495	400	2218	200	1425
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.09	0.70	0.08	0.12	1.00	0.49	0.36	0.99

## Intersection Summary
























# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.



HCM Signalized Intersection Capacity Analysis  
 1: Adelaide St N & Windermere Rd

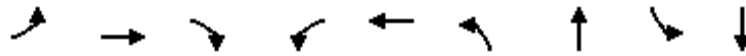
2029 Background PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	346	47	517	29	24	30	379	968	74	68	877	458
Future Volume (vph)	346	47	517	29	24	30	379	968	74	68	877	458
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1	4.0	6.1	6.1		4.0	5.8		5.8	5.8	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	0.99	1.00	1.00	0.98	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.92		1.00	0.99		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1921	1585	1790	1736		1807	3572		1824	3393	
Flt Permitted	0.72	1.00	1.00	0.73	1.00		0.08	1.00		0.26	1.00	
Satd. Flow (perm)	1354	1921	1585	1366	1736		158	3572		500	3393	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	364	49	544	31	25	32	399	1019	78	72	923	482
RTOR Reduction (vph)	0	0	26	0	23	0	0	5	0	0	62	0
Lane Group Flow (vph)	364	49	518	31	34	0	399	1092	0	72	1343	0
Confl. Peds. (#/hr)	10		17	17		10	7		2	2		7
Heavy Vehicles (%)	1%	0%	1%	0%	0%	0%	1%	1%	0%	0%	1%	1%
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8	5		4		5	2			6	
Permitted Phases	8		8	4			2			6		
Actuated Green, G (s)	29.9	29.9	49.9	29.9	29.9		68.2	68.2		44.2	44.2	
Effective Green, g (s)	29.9	29.9	49.9	29.9	29.9		68.2	68.2		44.2	44.2	
Actuated g/C Ratio	0.27	0.27	0.45	0.27	0.27		0.62	0.62		0.40	0.40	
Clearance Time (s)	6.1	6.1	4.0	6.1	6.1		4.0	5.8		5.8	5.8	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	368	522	719	371	471		397	2214		200	1363	
v/s Ratio Prot		0.03	0.13		0.02		c0.18	0.31			0.40	
v/s Ratio Perm	c0.27		0.20	0.02			c0.44			0.14		
v/c Ratio	0.99	0.09	0.72	0.08	0.07		1.01	0.49		0.36	0.99	
Uniform Delay, d1	39.9	29.9	24.4	29.8	29.7		35.6	11.4		23.0	32.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	43.5	0.1	3.6	0.1	0.1		46.4	0.8		5.0	21.2	
Delay (s)	83.4	30.0	27.9	29.9	29.8		82.0	12.2		28.0	53.8	
Level of Service	F	C	C	C	C		F	B		C	D	
Approach Delay (s)		49.1			29.9			30.8			52.5	
Approach LOS		D			C			C			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			43.1				HCM 2000 Level of Service				D	
HCM 2000 Volume to Capacity ratio			1.03									
Actuated Cycle Length (s)			110.0				Sum of lost time (s)			15.9		
Intersection Capacity Utilization			99.2%				ICU Level of Service			F		
Analysis Period (min)			15									

c Critical Lane Group

Timings

1: Adelaide St N & Windermere Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↗	↖	↕	↖	↕
Traffic Volume (vph)	162	19	293	22	16	309	823	32	810
Future Volume (vph)	162	19	293	22	16	309	823	32	810
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+pt	NA	Perm	NA
Protected Phases		8	5		4	5	2		6
Permitted Phases	8		8	4		2		6	
Detector Phase	8	8	8	4	4	5	2	6	6
Switch Phase									
Minimum Initial (s)	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0	7.0
Minimum Split (s)	33.1	33.1	9.0	33.1	33.1	9.0	43.8	43.8	43.8
Total Split (s)	38.0	38.0	18.0	38.0	38.0	18.0	72.0	54.0	54.0
Total Split (%)	34.5%	34.5%	16.4%	34.5%	34.5%	16.4%	65.5%	49.1%	49.1%
Yellow Time (s)	3.3	3.3	3.0	3.3	3.3	3.0	3.8	3.8	3.8
All-Red Time (s)	2.8	2.8	1.0	2.8	2.8	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	4.0	6.1	6.1	4.0	5.8	5.8	5.8
Lead/Lag			Lead			Lead		Lag	Lag
Lead-Lag Optimize?			Yes			Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max
Act Effct Green (s)	19.2	19.2	37.2	19.2	19.2	80.7	78.9	59.0	59.0
Actuated g/C Ratio	0.17	0.17	0.34	0.17	0.17	0.73	0.72	0.54	0.54
v/c Ratio	0.71	0.06	0.52	0.09	0.15	0.69	0.35	0.10	0.55
Control Delay	58.2	35.1	21.3	35.8	18.3	17.0	6.9	17.4	19.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.2	35.1	21.3	35.8	18.3	17.0	6.9	17.4	19.3
LOS	E	D	C	D	B	B	A	B	B
Approach Delay		34.5			24.0		9.6		19.2
Approach LOS		C			C		A		B

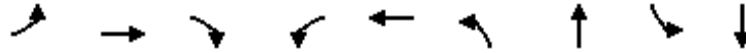
Intersection Summary

Cycle Length: 110  
 Actuated Cycle Length: 110  
 Offset: 57 (52%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.71  
 Intersection Signal Delay: 17.9  
 Intersection Capacity Utilization 78.5%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service D

Splits and Phases: 1: Adelaide St N & Windermere Rd



## 1: Adelaide St N &amp; Windermere Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	171	20	308	23	48	325	893	34	1042
v/c Ratio	0.71	0.06	0.52	0.09	0.15	0.69	0.35	0.10	0.55
Control Delay	58.2	35.1	21.3	35.8	18.3	17.0	6.9	17.4	19.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.2	35.1	21.3	35.8	18.3	17.0	6.9	17.4	19.3
Queue Length 50th (m)	35.0	3.6	36.4	4.2	3.1	19.3	32.6	3.5	73.4
Queue Length 95th (m)	53.1	9.4	51.0	10.3	12.0	53.7	54.9	10.9	111.7
Internal Link Dist (m)		267.6			300.4		227.3		193.7
Turn Bay Length (m)	60.0		60.0	30.0		70.0		30.0	
Base Capacity (vph)	399	530	661	412	520	480	2579	327	1887
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.04	0.47	0.06	0.09	0.68	0.35	0.10	0.55

## Intersection Summary

HCM Signalized Intersection Capacity Analysis  
1: Adelaide St N & Windermere Rd

2029 Background SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	162	19	293	22	16	29	309	823	26	32	810	180
Future Volume (vph)	162	19	293	22	16	29	309	823	26	32	810	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1	4.0	6.1	6.1		4.0	5.8		5.8	5.8	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.90		1.00	1.00		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1830	1602	1816	1720		1806	3596		1820	3491	
Flt Permitted	0.73	1.00	1.00	0.74	1.00		0.19	1.00		0.32	1.00	
Satd. Flow (perm)	1379	1830	1602	1423	1720		352	3596		611	3491	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	171	20	308	23	17	31	325	866	27	34	853	189
RTOR Reduction (vph)	0	0	51	0	26	0	0	1	0	0	14	0
Lane Group Flow (vph)	171	20	257	23	22	0	325	892	0	34	1028	0
Confl. Peds. (#/hr)	1		4	4		1	13		6	6		13
Heavy Vehicles (%)	1%	5%	1%	0%	0%	0%	1%	1%	0%	0%	1%	1%
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8	5		4		5	2			6	
Permitted Phases	8		8	4			2			6		
Actuated Green, G (s)	19.2	19.2	35.1	19.2	19.2		78.9	78.9		59.0	59.0	
Effective Green, g (s)	19.2	19.2	35.1	19.2	19.2		78.9	78.9		59.0	59.0	
Actuated g/C Ratio	0.17	0.17	0.32	0.17	0.17		0.72	0.72		0.54	0.54	
Clearance Time (s)	6.1	6.1	4.0	6.1	6.1		4.0	5.8		5.8	5.8	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	240	319	511	248	300		462	2579		327	1872	
v/s Ratio Prot		0.01	0.07		0.01		c0.10	0.25			0.29	
v/s Ratio Perm	c0.12		0.09	0.02			c0.40			0.06		
v/c Ratio	0.71	0.06	0.50	0.09	0.07		0.70	0.35		0.10	0.55	
Uniform Delay, d1	42.8	37.9	30.4	38.1	38.0		10.4	5.8		12.5	16.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.6	0.1	0.8	0.2	0.1		4.8	0.4		0.6	1.2	
Delay (s)	52.4	38.0	31.2	38.3	38.1		15.3	6.2		13.2	17.9	
Level of Service	D	D	C	D	D		B	A		B	B	
Approach Delay (s)		38.7			38.1			8.6			17.8	
Approach LOS		D			D			A			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			18.0			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			110.0			Sum of lost time (s)			15.9			
Intersection Capacity Utilization			78.5%			ICU Level of Service			D			
Analysis Period (min)			15									

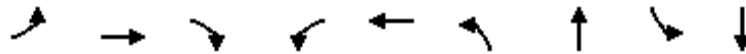
c Critical Lane Group

## **Appendix E – Synchro Output Reports - 2029 Total Traffic**

Timings

2029 Total PM

1: Adelaide St N & Windermere Rd

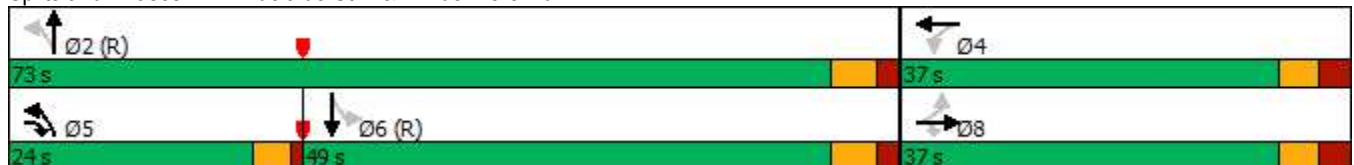


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↗	↖	↕	↖	↕
Traffic Volume (vph)	346	60	517	65	33	381	964	107	859
Future Volume (vph)	346	60	517	65	33	381	964	107	859
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+pt	NA	Perm	NA
Protected Phases		8	5		4	5	2		6
Permitted Phases	8		8	4		2		6	
Detector Phase	8	8	8	4	4	5	2	6	6
Switch Phase									
Minimum Initial (s)	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0	7.0
Minimum Split (s)	33.1	33.1	22.0	33.1	33.1	22.0	43.8	43.8	43.8
Total Split (s)	37.0	37.0	24.0	37.0	37.0	24.0	73.0	49.0	49.0
Total Split (%)	33.6%	33.6%	21.8%	33.6%	33.6%	21.8%	66.4%	44.5%	44.5%
Yellow Time (s)	3.3	3.3	3.0	3.3	3.3	3.0	3.8	3.8	3.8
All-Red Time (s)	2.8	2.8	1.0	2.8	2.8	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	4.0	6.1	6.1	4.0	5.8	5.8	5.8
Lead/Lag			Lead			Lead		Lag	Lag
Lead-Lag Optimize?			Yes			Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max
Act Effct Green (s)	30.9	30.9	53.0	30.9	30.9	69.0	67.2	43.2	43.2
Actuated g/C Ratio	0.28	0.28	0.48	0.28	0.28	0.63	0.61	0.39	0.39
v/c Ratio	0.99	0.12	0.69	0.18	0.17	1.00	0.50	0.58	0.99
Control Delay	84.1	30.2	23.3	31.6	14.6	77.9	12.8	40.2	53.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.1	30.2	23.3	31.6	14.6	77.9	12.8	40.2	53.9
LOS	F	C	C	C	B	E	B	D	D
Approach Delay		46.5			21.9		30.3		52.9
Approach LOS		D			C		C		D

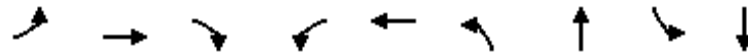
Intersection Summary

Cycle Length: 110  
 Actuated Cycle Length: 110  
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.00  
 Intersection Signal Delay: 42.0  
 Intersection LOS: D  
 Intersection Capacity Utilization 98.9%  
 ICU Level of Service F  
 Analysis Period (min) 15

Splits and Phases: 1: Adelaide St N & Windermere Rd



## 1: Adelaide St N &amp; Windermere Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	364	63	544	68	90	401	1093	113	1386
v/c Ratio	0.99	0.12	0.69	0.18	0.17	1.00	0.50	0.58	0.99
Control Delay	84.1	30.2	23.3	31.6	14.6	77.9	12.8	40.2	53.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.1	30.2	23.3	31.6	14.6	77.9	12.8	40.2	53.9
Queue Length 50th (m)	77.7	10.1	73.5	11.1	5.5	~70.0	63.5	18.7	145.2
Queue Length 95th (m)	#136.7	20.5	109.5	22.4	17.4	#131.9	79.2	40.0	#196.6
Internal Link Dist (m)		267.6			113.1		89.4		193.7
Turn Bay Length (m)	60.0		60.0	30.0		70.0		30.0	
Base Capacity (vph)	369	539	787	378	522	400	2186	196	1395
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.12	0.69	0.18	0.17	1.00	0.50	0.58	0.99

## Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
























Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis  
1: Adelaide St N & Windermere Rd

2029 Total PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	346	60	517	65	33	52	381	964	74	107	859	458
Future Volume (vph)	346	60	517	65	33	52	381	964	74	107	859	458
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1	4.0	6.1	6.1		4.0	5.8		5.8	5.8	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	0.99	1.00	1.00	0.98	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.91		1.00	0.99		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1921	1585	1790	1719		1807	3572		1824	3390	
Flt Permitted	0.70	1.00	1.00	0.72	1.00		0.08	1.00		0.26	1.00	
Satd. Flow (perm)	1315	1921	1585	1349	1719		161	3572		502	3390	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	364	63	544	68	35	55	401	1015	78	113	904	482
RTOR Reduction (vph)	0	0	25	0	40	0	0	5	0	0	64	0
Lane Group Flow (vph)	364	63	519	68	50	0	401	1088	0	113	1322	0
Confl. Peds. (#/hr)	10		17	17		10	7		2	2		7
Heavy Vehicles (%)	1%	0%	1%	0%	0%	0%	1%	1%	0%	0%	1%	1%
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8	5		4		5	2			6	
Permitted Phases	8		8	4			2			6		
Actuated Green, G (s)	30.9	30.9	50.9	30.9	30.9		67.2	67.2		43.2	43.2	
Effective Green, g (s)	30.9	30.9	50.9	30.9	30.9		67.2	67.2		43.2	43.2	
Actuated g/C Ratio	0.28	0.28	0.46	0.28	0.28		0.61	0.61		0.39	0.39	
Clearance Time (s)	6.1	6.1	4.0	6.1	6.1		4.0	5.8		5.8	5.8	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	369	539	733	378	482		397	2182		197	1331	
v/s Ratio Prot		0.03	0.13		0.03		c0.18	0.30			0.39	
v/s Ratio Perm	c0.28		0.20	0.05			c0.43			0.23		
v/c Ratio	0.99	0.12	0.71	0.18	0.10		1.01	0.50		0.57	0.99	
Uniform Delay, d1	39.3	29.4	23.6	30.0	29.3		35.4	12.0		26.2	33.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	42.8	0.1	3.1	0.2	0.1		47.7	0.8		11.6	23.2	
Delay (s)	82.2	29.5	26.7	30.2	29.4		83.2	12.8		37.8	56.4	
Level of Service	F	C	C	C	C		F	B		D	E	
Approach Delay (s)		47.7			29.7			31.7			55.0	
Approach LOS		D			C			C			E	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			43.9				HCM 2000 Level of Service				D	
HCM 2000 Volume to Capacity ratio			1.03									
Actuated Cycle Length (s)			110.0				Sum of lost time (s)			15.9		
Intersection Capacity Utilization			98.9%				ICU Level of Service			F		
Analysis Period (min)			15									

c Critical Lane Group



# HCM Unsignalized Intersection Capacity Analysis

## 2: North Site Access & Windermere Rd

2029 Total PM














Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↔	↔
Traffic Volume (veh/h)	184	57	4	79	71	5
Future Volume (Veh/h)	184	57	4	79	71	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	194	60	4	83	75	5
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)	137					
pX, platoon unblocked			0.97		0.97	0.97
vC, conflicting volume			254		315	224
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			215		278	184
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		89	99
cM capacity (veh/h)			1314		688	832
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>			
Volume Total	254	87	80			
Volume Left	0	4	75			
Volume Right	60	0	5			
cSH	1700	1314	696			
Volume to Capacity	0.15	0.00	0.11			
Queue Length 95th (m)	0.0	0.1	2.9			
Control Delay (s)	0.0	0.4	10.8			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.4	10.8			
Approach LOS			B			
<b>Intersection Summary</b>						
Average Delay			2.1			
Intersection Capacity Utilization			24.1%	ICU Level of Service	A	
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 3: Adelaide St N & West Site Access

2029 Total PM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 			 
Traffic Volume (veh/h)	0	16	1403	40	0	1441
Future Volume (Veh/h)	0	16	1403	40	0	1441
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	17	1477	42	0	1517
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						113
pX, platoon unblocked	0.65					
vC, conflicting volume	2256	760			1519	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1848	760			1519	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	95			100	
cM capacity (veh/h)	43	349			435	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	17	985	534	758	758	
Volume Left	0	0	0	0	0	
Volume Right	17	0	42	0	0	
cSH	349	1700	1700	1700	1700	
Volume to Capacity	0.05	0.58	0.31	0.45	0.45	
Queue Length 95th (m)	1.2	0.0	0.0	0.0	0.0	
Control Delay (s)	15.9	0.0	0.0	0.0	0.0	
Lane LOS	C					
Approach Delay (s)	15.9	0.0		0.0		
Approach LOS	C					
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			50.1%		ICU Level of Service	A
Analysis Period (min)			15			

Timings

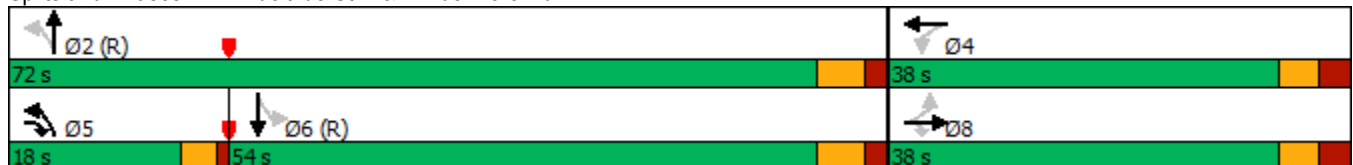
1: Adelaide St N & Windermere Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	162	36	293	81	28	312	817	94	780
Future Volume (vph)	162	36	293	81	28	312	817	94	780
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+pt	NA	Perm	NA
Protected Phases		8	5		4	5	2		6
Permitted Phases	8		8	4		2		6	
Detector Phase	8	8	8	4	4	5	2	6	6
Switch Phase									
Minimum Initial (s)	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0	7.0
Minimum Split (s)	33.1	33.1	9.0	33.1	33.1	9.0	43.8	43.8	43.8
Total Split (s)	38.0	38.0	18.0	38.0	38.0	18.0	72.0	54.0	54.0
Total Split (%)	34.5%	34.5%	16.4%	34.5%	34.5%	16.4%	65.5%	49.1%	49.1%
Yellow Time (s)	3.3	3.3	3.0	3.3	3.3	3.0	3.8	3.8	3.8
All-Red Time (s)	2.8	2.8	1.0	2.8	2.8	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	4.0	6.1	6.1	4.0	5.8	5.8	5.8
Lead/Lag			Lead			Lead		Lag	Lag
Lead-Lag Optimize?			Yes			Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max
Act Effct Green (s)	19.7	19.7	37.1	19.7	19.7	80.2	78.4	59.1	59.1
Actuated g/C Ratio	0.18	0.18	0.34	0.18	0.18	0.73	0.71	0.54	0.54
v/c Ratio	0.72	0.12	0.52	0.34	0.27	0.70	0.35	0.30	0.54
Control Delay	59.0	35.6	20.5	41.2	15.1	16.5	7.1	20.5	18.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.0	35.6	20.5	41.2	15.1	16.5	7.1	20.5	18.9
LOS	E	D	C	D	B	B	A	C	B
Approach Delay		34.3			27.2		9.6		19.1
Approach LOS		C			C		A		B

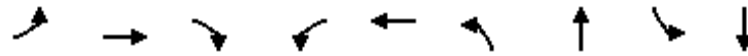
Intersection Summary

Cycle Length: 110  
 Actuated Cycle Length: 110  
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.72  
 Intersection Signal Delay: 18.4  
 Intersection LOS: B  
 Intersection Capacity Utilization 78.7%  
 ICU Level of Service D  
 Analysis Period (min) 15

Splits and Phases: 1: Adelaide St N & Windermere Rd



## 1: Adelaide St N &amp; Windermere Rd


























Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	171	38	308	85	98	328	887	99	1010
v/c Ratio	0.72	0.12	0.52	0.34	0.27	0.70	0.35	0.30	0.54
Control Delay	59.0	35.6	20.5	41.2	15.1	16.5	7.1	20.5	18.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.0	35.6	20.5	41.2	15.1	16.5	7.1	20.5	18.9
Queue Length 50th (m)	35.0	6.9	35.2	16.1	5.3	20.1	33.2	11.4	69.6
Queue Length 95th (m)	53.1	14.5	49.8	27.9	17.6	52.1	55.9	28.6	107.0
Internal Link Dist (m)		267.6			113.1		89.4		193.7
Turn Bay Length (m)	60.0		60.0	30.0		70.0		30.0	
Base Capacity (vph)	382	530	666	406	542	484	2562	329	1887
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.07	0.46	0.21	0.18	0.68	0.35	0.30	0.54

## Intersection Summary

HCM Signalized Intersection Capacity Analysis  
1: Adelaide St N & Windermere Rd

2029 Total SAT

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	162	36	293	81	28	66	312	817	26	94	780	180
Future Volume (vph)	162	36	293	81	28	66	312	817	26	94	780	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1	4.0	6.1	6.1		4.0	5.8		5.8	5.8	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.89		1.00	1.00		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1830	1601	1817	1702		1806	3595		1820	3487	
Flt Permitted	0.69	1.00	1.00	0.73	1.00		0.20	1.00		0.32	1.00	
Satd. Flow (perm)	1318	1830	1601	1400	1702		372	3595		614	3487	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	171	38	308	85	29	69	328	860	27	99	821	189
RTOR Reduction (vph)	0	0	57	0	57	0	0	1	0	0	15	0
Lane Group Flow (vph)	171	38	251	85	41	0	328	886	0	99	995	0
Confl. Peds. (#/hr)	1		4	4		1	13		6	6		13
Heavy Vehicles (%)	1%	5%	1%	0%	0%	0%	1%	1%	0%	0%	1%	1%
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8	5		4		5	2			6	6
Permitted Phases	8		8	4			2			6		
Actuated Green, G (s)	19.7	19.7	35.0	19.7	19.7		78.4	78.4		59.1	59.1	
Effective Green, g (s)	19.7	19.7	35.0	19.7	19.7		78.4	78.4		59.1	59.1	
Actuated g/C Ratio	0.18	0.18	0.32	0.18	0.18		0.71	0.71		0.54	0.54	
Clearance Time (s)	6.1	6.1	4.0	6.1	6.1		4.0	5.8		5.8	5.8	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	236	327	509	250	304		464	2562		329	1873	
v/s Ratio Prot		0.02	0.07		0.02		c0.10	0.25			0.29	
v/s Ratio Perm	c0.13		0.09	0.06			c0.40			0.16		
v/c Ratio	0.72	0.12	0.49	0.34	0.14		0.71	0.35		0.30	0.53	
Uniform Delay, d1	42.6	37.9	30.3	39.5	38.0		10.0	6.0		14.0	16.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.5	0.2	0.8	0.8	0.2		4.9	0.4		2.3	1.1	
Delay (s)	53.1	38.0	31.1	40.3	38.2		14.8	6.4		16.4	17.6	
Level of Service	D	D	C	D	D		B	A		B	B	
Approach Delay (s)		38.9			39.2			8.7			17.5	
Approach LOS		D			D			A			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			18.9				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			110.0				Sum of lost time (s)			15.9		
Intersection Capacity Utilization			78.7%				ICU Level of Service			D		
Analysis Period (min)			15									

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis  
2: North Site Access & Windermere Rd












2029 Total SAT



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	69	87	8	59	116	8
Future Volume (Veh/h)	69	87	8	59	116	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	73	92	8	62	122	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)	137					
pX, platoon unblocked			1.00		1.00	1.00
vC, conflicting volume			165		197	119
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			158		190	112
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		85	99
cM capacity (veh/h)			1414		790	936
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	165	70	130			
Volume Left	0	8	122			
Volume Right	92	0	8			
cSH	1700	1414	798			
Volume to Capacity	0.10	0.01	0.16			
Queue Length 95th (m)	0.0	0.1	4.4			
Control Delay (s)	0.0	0.9	10.4			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.9	10.4			
Approach LOS			B			
Intersection Summary						
Average Delay			3.9			
Intersection Capacity Utilization			23.4%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
3: Adelaide St N & West Site Access

2029 Total SAT

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 			 
Traffic Volume (veh/h)	0	27	1128	63	0	1154
Future Volume (Veh/h)	0	27	1128	63	0	1154
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	28	1187	66	0	1215
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						113
pX, platoon unblocked	0.83					
vC, conflicting volume	1828	626			1253	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1579	626			1253	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	93			100	
cM capacity (veh/h)	82	427			551	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	28	791	462	608	608	
Volume Left	0	0	0	0	0	
Volume Right	28	0	66	0	0	
cSH	427	1700	1700	1700	1700	
Volume to Capacity	0.07	0.47	0.27	0.36	0.36	
Queue Length 95th (m)	1.6	0.0	0.0	0.0	0.0	
Control Delay (s)	14.0	0.0	0.0	0.0	0.0	
Lane LOS	B					
Approach Delay (s)	14.0	0.0		0.0		
Approach LOS	B					
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			43.2%		ICU Level of Service	A
Analysis Period (min)			15			

